

# Management of National Parks and Sanctuaries in India

## A STATUS REPORT

Ashish Kothari  
Pratibha Pande  
Shekhar Singh  
Dilnavaz Variava

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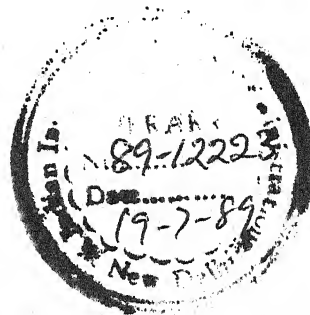
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## Glossary of Terms and Abbreviations

adjacent area	10 kms. radius from park or sanctuary boundary
ave. or avg.	average
bunds	raised earthen ridges, usually for soil and water conservation
comm.	communication
dinghies	small boats
FAO	Food and Agricultural Organisation of the United Nations
F & WL	Forests and Wildlife
ha.	hectares
IIPA	Indian Institute of Public Administration, New Delhi
IUCN	International Union for the Conservation of Nature and Natural Resources
jt.	Joint
msl	Mean Sea level
m.	metres
n.a.	not available
NGIs	Non-governmental individuals
NGOs	Non-governmental organisations
no.	number(s)
NP	national park
n.r.	not relevant
N/S	national parks and sanctuaries
Park Manager	An officer of any designation or level holding overall responsibility for a park or sanctuary.
Pers.	Personal
pop.	population
protected areas	national parks and sanctuaries
S	sanctuary
Smt.	Srimati (Mrs.)
state	union territory or state
T	total
toposheet	Topographical Sheet of the Survey of India
U.T.	Union Territory
WL	Wildlife ( spelled as 'Wild Life' in the Wild Life (Protection) Act of 1972)
yatra	trip/pilgrimage

## Abbreviated Forms of States and Union Territories

A&N	Andaman and Nicobar Islands	MAH	Maharashtra
AP/A.P.	Andhra Pradesh	MAN	Manipur
ARU	Arunachal Pradesh	MEG	Meghalaya
ASS	Assam	MIZ	Mizoram
BIH	Bihar	MP/M.P.	Madhya Pradesh
CHA	Chandigarh	NAG	Nagaland
DEL	Delhi	ORI	Orissa
GUJ	Gujarat	PUN	Punjab
HAR	Haryana	RAJ	Rajasthan
HP/H.P.	Himachal Pradesh	SIK	Sikkim
J&K	Jammu and Kashmir	TN/T.N.	Tamil Nadu
KAR	Karnataka	UP/U.P.	Uttar Pradesh
KER	Kerala	WB/W.B.	West Bengal

## Preface

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The proper management of our national parks and sanctuaries is crucial to the conservation of our natural heritage. These national parks and sanctuaries contain much of the best of our remaining forests and other natural ecosystems, and are also repositories of the genetic diversity that our country has been blessed with. The preservation of our genetic diversity is today increasingly recognised as crucial not only for our immediate future, but also to keep alive the hope of developments in bio-genetics, which may help in solving some of the most pressing problems of humanity: those of hunger, of disease, and of environmental degradation.

The growing awareness concerning the need to better conserve nature is still unfortunately tempered by some misgivings. It is sometimes felt that environmental concerns are in contradiction with concerns about social and economic development, or that they are elitist, favouring plants and animals over human beings, and the richer human beings over the poor.

A rational concern for the natural environment follows from the realisation and acceptance of certain truths:

- That nature is a bedrock to social and economic well-being. No 'development' can be sustained without it.
- That nature has a carrying capacity beyond which it collapses, similar to human beings who can survive only so much of physical or mental abuse.
- That nature's carrying capacity is taxed both by pollution, and by extraction of resources beyond its ability to regenerate. This is also similar to human beings, who cannot survive if poison is dumped into their system or if their blood is drained.

It has been seen, again and again, that the first victims of environmental degradation are the poor people, for they are the most dependent on nature's bounty, not having the money to benefit from the market system. They have no gas or kerosene stoves, so they need to gather firewood from the forests. They have no piped water and survive on the perenniality of streams and wells. They cannot afford artificial fertilisers and need their topsoil intact.

For a large majority of our fellow humans the network of nature is as essential for their material and cultural survival as seems to be the artificial network of concrete buildings and roads, electricity, water taps, universities and theatres for us. And even we, the privileged few, often forget that behind these taps and electric switches there must lie a natural system which makes available the water or the raw materials for our consumption.

To believe, then, that it is unimportant to conserve nature, or anti-developmental, or elitist, is to delude oneself in a very dangerous manner. It is

not the GNP or the foreign exchange balance of a country which represent its wealth, for these are transient indicators of a fragile system. The real wealth of a nation is its natural wealth.

It is with this conviction that we present an analysis of current efforts at the conservation of nature, specifically in our national parks and sanctuaries.

It is our hope, and belief, that through this and many other such studies the citizens of India can meaningfully participate in the important and urgent task of preserving life-support systems for the future generations.

## ACKNOWLEDGEMENTS

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Many people contributed to the framing of the questionnaire. Special mention must be made of the late Shri S.P. Shahi, Shri L.H.A. Lego, Shri Samar Singh, Shri N.D. Jayal, Shri Shyam Joseph and Shri P. Kannan. Shri J.C. Daniel and the staff of the Bombay Natural History Society have been ever willing to provide any assistance which was called for.

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But above all, our heartfelt thanks to the Chief Wildlife Wardens and other wildlife officials who so painstakingly filled in our questionnaires, and facilitated field visits, always ready to answer queries and to spare time. It is to these guardians of India's wildlife that this report is dedicated.

**National Parks and Sanctuaries in India**  
(Mainland)

72° 80° 88°

32° 24° 16° 8°

Arabic Sea

Bay of Bengal

INDIAN OCEAN

72° 80° 88°

Date of update April 1989

Source: See note in detailed list

Date of update April 1989

# National Parks and Sanctuaries in India

*Showing the nos. against each as marked in the map of India (As on March 1, 1989)*

## ANDAMAN AND NICOBAR ISLANDS

1.	A&N/N/MAR	MARINE NATIONAL PARK
2.	A&N/N/MID	MIDDLE BUTTON ISLAND NATIONAL PARK
3.	A&N/N/MOU	MOUNT HARRIET NATIONAL PARK (Harriett)**
4.	A&N/N/NOR	NORTH BUTTON ISLAND NATIONAL PARK
5.	A&N/N/SAD	SADDLE PEAK NATIONAL PARK
6.	A&N/N/SOU	SOUTH BUTTON ISLAND NATIONAL PARK
7.	A&N/S/ARI	ARIAL ISLAND SANCTUARY
8.	A&N/S/BAM	BAMBOO ISLAND SANCTUARY
9.	A&N/S/BAR	BARREN ISLAND SANCTUARY
10.	A&N/S/BAT	BATTIMALV ISLAND SANCTUARY
#11.	A&N/S/BEL	BELLE ISLAND SANCTUARY
12.	A&N/S/BEN	BENNETT ISLAND SANCTUARY (Benett)**
13.	A&N/S/BIN	BINGHAM ISLAND SANCTUARY
14.	A&N/S/BLI	BLISTER ISLAND SANCTUARY
15.	A&N/S/BLU	BLUFF ISLAND SANCTUARY
16.	A&N/S/BOU	BOUDEVILLE ISLAND SANCTUARY (Bondoville)**
17.	A&N/S/BRU	BRUSH ISLAND SANCTUARY
18.	A&N/S/BUC	BUCHANAN ISLAND SANCTUARY
19.	A&N/S/CHA	CHANNEL ISLAND SANCTUARY (Chanel)**
20.	A&N/S/CIN	CINQUE ISLAND SANCTUARY
21.	A&N/S/CLY	CLYDE ISLAND SANCTUARY (Clyd)**
22.	A&N/S/CON	CONE ISLAND SANCTUARY
23.	A&N/S/CRO	CROCODILE (LOHABARRACK) SANCTUARY (Salt water Crocodile)**
24.	A&N/S/CURI	CURLEW ISLAND SANCTUARY
25.	A&N/S/CURL	CURLEW (B.P.) ISLAND SANCTUARY
26.	A&N/S/DEF	DEFENCE ISLAND SANCTUARY
27.	A&N/S/DOTI	DOT ISLAND SANCTUARY
28.	A&N/S/DOTT	DOTTREL ISLAND SANCTUARY
29.	A&N/S/DUN	DUNCAN ISLAND SANCTUARY
30.	A&N/S/EASI	EAST ISLAND SANCTUARY
31.	A&N/S/EAST	EAST OR INGLIS ISLAND SANCTUARY
32.	A&N/S/EGG	EGG ISLAND SANCTUARY
33.	A&N/S/ENT	ENTRANCE ISLAND SANCTUARY
34.	A&N/S/FLA	FLAT ISLAND SANCTUARY (Elat)**
35.	A&N/S/GAN	GANDER ISLAND SANCTUARY
36.	A&N/S/GOO	GOOSE ISLAND SANCTUARY
37.	A&N/S/GUR	GURJON ISLAND SANCTUARY (Girjan)**
38.	A&N/S/HUM	HUMP ISLAND SANCTUARY
39.	A&N/S/INT	INTERVIEW ISLAND SANCTUARY
40.	A&N/S/JAM	JAMES ISLAND SANCTUARY
41.	A&N/S/JUN	JUNGLE ISLAND SANCTUARY
42.	A&N/S/KWA	KWANGTUNG ISLAND SANCTUARY
43.	A&N/S/KYD	KYD ISLAND SANCTUARY
44.	A&N/S/LAN	LANDFALL ISLAND SANCTUARY
45.	A&N/S/LAT	LATOUCHE ISLAND SANCTUARY
46.	A&N/S/MAN	MANGROVE ISLAND SANCTUARY
47.	A&N/S/MAS	MASK ISLAND SANCTUARY
48.	A&N/S/MAY	MAYO ISLAND SANCTUARY
49.	A&N/S/MEG	MEGAPODE ISLAND SANCTUARY
50.	A&N/S/MON	MONTGEMERY ISLAND SANCTUARY (Montgomery)**

51.	A&N/S/NAR	NARCONDAM SANCTUARY
52.	A&N/S/NORB	NORTH BROTHER ISLAND SANCTUARY
53.	A&N/S/NORI	NORTH ISLAND SANCTUARY
54.	A&N/S/NORR	NORTH REEF ISLAND SANCTUARY
55.	A&N/S/OLI	OLIVER ISLAND SANCTUARY
56.	A&N/S/ORC	ORCHID ISLAND SANCTUARY
57.	A&N/S/OX	OX ISLAND SANCTUARY
58.	A&N/S/OYSI	OYSTER ISLAND-1 SANCTUARY
59.	A&N/S/OYS2	OYSTER ISLAND-2 SANCTUARY
60.	A&N/S/PAG	PAGET ISLAND SANCTUARY
61.	A&N/S/PAR	PARKINSON ISLAND SANCTUARY
62.	A&N/S/PAS	PASSAGE ISLAND SANCTUARY
63.	A&N/S/PAT	PATRIC ISLAND SANCTUARY
64.	A&N/S/PET	PETMAN ISLAND SANCTUARY (Pitman)**
65.	A&N/S/POC	POCOCK ISLAND SANCTUARY (Peacock)**
66.	A&N/S/POI	POINT ISLAND SANCTUARY
67.	A&N/S/POT	POTANMA ISLAND SANCTUARY
68.	A&N/S/RAN	RANGER ISLAND SANCTUARY
69.	A&N/S/REE	REEF ISLAND SANCTUARY
70.	A&N/S/ROP	ROPER ISLAND SANCTUARY
71.	A&N/S/ROS	ROSS ISLAND SANCTUARY
72.	A&N/S/ROW	ROWE ISLAND SANCTUARY
73.	A&N/S/SAN	SANDY ISLAND SANCTUARY
74.	A&N/S/SEA	SEA SERPENT ISLAND SANCTUARY
75.	A&N/S/SHA	SHARK ISLAND SANCTUARY
76.	A&N/S/SHE	SHEARME ISLAND SANCTUARY
77.	A&N/S/SIR	SIR HUGH ROSE ISLAND SANCTUARY
78.	A&N/S/SIS	SISTERS ISLAND SANCTUARY
79.	A&N/S/SNA1	SNAKE ISLAND-1 SANCTUARY
80.	A&N/S/SNA2	SNAKE ISLAND-2 SANCTUARY
81.	A&N/S/SOUB	SOUTH BROTHER SANCTUARY
82.	A&N/S/SOUR	SOUTH REEF ISLAND SANCTUARY
83.	A&N/S/SOUS	SOUTH SENTINEL ISLAND SANCTUARY (Sentinal) **
#84.	A&N/S/SPI1	SPIKE ISLAND-1 SANCTUARY
85.	A&N/S/SPI2	SPIKE ISLAND-2 SANCTUARY
86.	A&N/S/STO	STOAT ISLAND SANCTUARY
87.	A&N/S/SUR	SURAT ISLAND SANCTUARY
88.	A&N/S/SWA	SWAMP ISLAND SANCTUARY
89.	A&N/S/TABD	TABLE (DELGARNO) ISLAND SANCTUARY
90.	A&N/S/TABE	TABLE (EXCELSIOR) ISLAND SANCTUARY
91.	A&N/S/TAL	TALAKAICHA ISLAND SANCTUARY (Talabaicha) **
92.	A&N/S/TEM	TEMPLE ISLAND SANCTUARY
93.	A&N/S/TIL	TILLONGCHANG ISLAND SANCTUARY
94.	A&N/S/TRE	TREE ISLAND SANCTUARY
95.	A&N/S/TRI	TRILBY ISLAND SANCTUARY
#96.	A&N/S/TUF	TUFT ISLAND SANCTUARY
97.	A&N/S/TUR	TURTLE ISLAND SANCTUARY
98.	A&N/S/WES	WEST ISLAND SANCTUARY
#99.	A&N/S/WHA	WHARF ISLAND SANCTUARY
100.	A&N/S/WHI	WHITE CLIFF ISLAND SANCTUARY

#### ANDHRA PRADESH

1.	AP/S/COR	CORINGA SANCTUARY
2.	AP/S/ETU	ETURNAGARAM SANCTUARY
3.	AP/S/KAW	KAWAL SANCTUARY
4.	AP/S/KIN	KINNERSANI SANCTUARY
5.	AP/S/KOL	KOLLERU SANCTUARY
6.	AP/S/LAN	LANJAMADUGU SANCTUARY

- |              |                                    |
|--------------|------------------------------------|
| 7. AP/S/MAN  | MANJIRA SANCTUARY                  |
| 8. AP/S/NAG  | NAGARJUNASAGAR SRISAILAM SANCTUARY |
| 9. AP/S/NEE  | NEELAPATTU SANCTUARY               |
| 10. AP/S/PAK | PAKHAL SANCTUARY                   |
| 11. AP/S/PAP | PAPIKONDA SANCTUARY                |
| 12. AP/S/POC | POCHARAM SANCTUARY                 |
| 13. AP/S/PRA | PRANHITA SANCTUARY                 |
| 14. AP/S/PUL | PULICAT SANCTUARY                  |
| 15. AP/S/SHR | SRIVENKATESWARA SANCTUARY          |
| 16. AP/S/SIW | SIWARAM SANCTUARY                  |

## ARUNACHAL PRADESH

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- |              |                        |
|--------------|------------------------|
| 1. ARU/N/MOI | MOILING NATIONAL PARK  |
| 2. ARU/N/NAM | NAMDAPHA NATIONAL PARK |
| 3. ARU/S/ITA | ITANAGAR SANCTUARY     |
| 4. ARU/S/LAL | LALI SANCTUARY         |
| 5. ARU/S/MEH | MEHAO SANCTUARY        |
| 6. ARU/S/PAK | PAKHUI SANCTUARY       |

## ASSAM

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- |              |                               |
|--------------|-------------------------------|
| 1. ASS/N/KAZ | KAZIRANGA NATIONAL PARK       |
| 2. ASS/N/MAN | MANAS NATIONAL PARK (Monas)** |
| 3. ASS/S/BAR | BARNADI SANCTUARY             |
| 4. ASS/S/GAR | GARAMPANI SANCTUARY           |
| 5. ASS/S/LAW | LAWKHOWA SANCTUARY            |
| 6. ASS/S/NAM | NAMERI SANCTUARY              |
| 7. ASS/S/ORA | ORANG SANCTUARY               |
| 8. ASS/S/PAB | PABHA SANCTUARY               |
| 9. ASS/S/POB | POBITORA SANCTUARY            |

## BIHAR

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- |               |                         |
|---------------|-------------------------|
| 1. BIH/N/PAL  | PALAMAU NATIONAL PARK   |
| 2. BIH/S/BHI  | BHIMBANDH SANCTUARY     |
| 3. BIH/S/DAL  | DALMA SANCTUARY         |
| 4. BIH/S/GAU  | GAUTAM BUDHA SANCTUARY  |
| 5. BIH/S/HAZ  | HAZARIBAGH SANCTUARY    |
| 6. BIH/S/KAI  | KAIMUR SANCTUARY        |
| 7. BIH/S/KOD  | KODARMA SANCTUARY       |
| 8. BIH/S/LAW  | LAWALONG SANCTUARY      |
| 9. BIH/S/MAH  | MAHUADAUR SANCTUARY     |
| 10. BIH/S/NAG | NAGI DAM SANCTUARY      |
| 11. BIH/S/NAK | NAKTI DAM SANCTUARY     |
| 12. BIH/S/PAR | PARASNATH SANCTUARY     |
| 13. BIH/S/RAJ | RAJGIR SANCTUARY        |
| 14. BIH/S/TOP | TOPCHANCHI SANCTUARY    |
| 15. BIH/S/UDA | UDAIPUR SANCTUARY       |
| 16. BIH/S/VAL | VALMIKI NAGAR SANCTUARY |

## CHANDIGARH

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- |              |                  |
|--------------|------------------|
| 1. CHA/S/SUK | SUKHNA SANCTUARY |
|--------------|------------------|

**DELHI**

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- |              |                                |
|--------------|--------------------------------|
| 1. DEL/S/IND | INDIRA PRIYADARSHINI SANCTUARY |
|--------------|--------------------------------|
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**GOA**

- 
- |              |   |
|--------------|---|
| 1. GOA/N/BHA | BHAGWAN MAHAVIR NATIONAL PARK                         |
| 2. GOA/S/BHA | BHAGWAN MAHAVIR SANCTUARY (Location same as 1 on map) |
| 3. GOA/S/BOH | BONDLA SANCTUARY                                      |
| 4. GOA/S/COT | COTIGAO SANCTUARY                                     |
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**GUJARAT**

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- |               |  |
|---------------|--|
| 1. GUJ/N/BAN  | BANSDA NATIONAL PARK                         |
| 2. GUJ/N/GIR  | GIR NATIONAL PARK                            |
| 3. GUJ/N/MAR  | MARINE NATIONAL PARK                         |
| 4. GUJ/N/VEL  | VELAVADAR NATIONAL PARK                      |
| 5. GUJ/S/BAR  | BARDA SANCTUARY                              |
| 6. GUJ/S/DHR  | DHRANGADHRA SANCTUARY (Wild Asses) **        |
| 7. GUJ/S/GIR  | GIR SANCTUARY (Location same as 2 on map)    |
| 8. GUJ/S/HIN  | HINGOLGADH SANCTUARY                         |
| 9. GUJ/S/JES  | JESSORE SANCTUARY                            |
| 10. GUJ/S/KHI | KHIJADIYA SANCTUARY                          |
| 11. GUJ/S/KAC | KACHCHH DESERT SANCTUARY                     |
| 12. GUJ/S/MAR | MARINE SANCTUARY (Location same as 3 on map) |
| 13. GUJ/S/NAL | NALSAROVAR SANCTUARY                         |
| 14. GUJ/S/NAR | NARAYAN SAROVAR SANCTUARY                    |
| 15. GUJ/S/RAT | RATANMAHAL SANCTUARY                         |
| 16. GUJ/S/SHO | SHOOLPANESHWAR SANCTUARY (Sloth Bear)**      |
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**HARYANA**

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- |              |                               |
|--------------|-------------------------------|
| 1. HAR/S/BHI | BHINDAWAS SANCTUARY           |
| 2. HAR/S/BIR | BIR SHIKARGAH SANCTUARY       |
| 3. HAR/S/CHH | CHHILLHILA SANCTUARY          |
| 4. HAR/S/CHO | CHOTALA SANCTUARY             |
| 5. HAR/S/NAH | NAHAR SANCTUARY               |
| 6. HAR/S/SAR | SARSWATI PLANTATION SANCTUARY |
| 7. HAR/S/SUL | SULTANPUR SANCTUARY           |
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**HIMACHAL PRADESH**

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- |              |                               |
|--------------|-------------------------------|
| 1. HP/N/GRE  | GREAT HIMALAYAN NATIONAL PARK |
| 2. HP/N/PIN  | PIN VALLEY NATIONAL PARK      |
| 3. HP/S/BAN  | BANDLI SANCTUARY              |
| 4. HP/S/CHA  | CHAIL SANCTUARY               |
| 5. HP/S/CHU  | CHURDHAR SANCTUARY            |
| 6. HP/S/DARA | DARANGHATI SANCTUARY          |
| 7. HP/S/DARL | DARLAGHAT SANCTUARY           |
| 8. HP/S/GAM  | GAMGUL SIAHBEHI SANCTUARY     |
| 9. HP/S/GOB  | GOBIND SAGAR SANCTUARY        |
| 10. HP/S/KAI | KAIS SANCTUARY                |
| 11. HP/S/KAL | KALATOP KHAJJIAR SANCTUARY    |
| 12. HP/S/KAN | KANAWAR SANCTUARY             |
| 13. HP/S/KHO | KHOKHAN SANCTUARY             |
| 14. HP/S/KUG | KUGTI SANCTUARY               |
| 15. HP/S/LIP | LIPPA ASRANG SANCTUARY        |
-

16. HP/S/MAJ	MAJATHAL SANCTUARY
17. HP/S/MAN	MANALI SANCTUARY
18. HP/S/NAI	NAINA DEVI SANCTUARY
19. HP/S/NAR	NARGU SANCTUARY
20. HP/S/PON	PONG LAKE SANCTUARY
21. HP/S/RAK	RAKCHHAM CHITKUL SANCTUARY
22. HP/S/REN	RENUKA SANCTUARY
23. HP/S/RUP	RUPI BHABA SANCTUARY
24. HP/S/SEC	SECHU TUAN NALA SANCTUARY
25. HP/S/SHIK	SHIKARI DEVI SANCTUARY
26. HP/S/SHIL	SHILLI SANCTUARY
27. HP/S/SHIM	SHIMLA WATER CATCHMENT AREA SANCTUARY
28. HP/S/SIM	SIMBALBARA SANCTUARY
29. HP/S/TAL	TALRA SANCTUARY
30. HP/S/TIR	TIRTHAN SANCTUARY
31. HP/S/TUN	TUNDAH SANCTUARY

## JAMMU AND KASHMIR

1. J&K/N/DAC	DACHIGAM NATIONAL PARK
2. J&K/N/HEM	HEMIS HIGH ALTITUDE NATIONAL PARK
3. J&K/N/KIS	KISHTWAR NATIONAL PARK
4. J&K/N/SAL	SALIM ALI NATIONAL PARK
5. J&K/S/BAL	BALTAL SANCTUARY
6. J&K/S/CHA	CHANGTHANG SANCTUARY (High Altitude Cold)**
7. J&K/S/GUL	GULMARG SANCTUARY
8. J&K/S/HIR	HIRAPORA SANCTUARY
9. J&K/S/JAS	JASROTA SANCTUARY
10. J&K/S/KAR	KARAKORAM SANCTUARY (Karakoram)**
*11. J&K/S/LAC	LACHIPORA SANCTUARY
*12. J&K/S/LIM	LIMBER SANCTUARY
13. J&K/S/NAN	NANDNI SANCTUARY
14. J&K/S/OVE	OVERA-ARU SANCTUARY
15. J&K/S/RAM	RAMNAGAR SANCTUARY
16. J&K/S/SUR	SURINSAR-MANSAR SANCTUARY
17. J&K/S/TRI	TRIKUTA SANCTUARY

## KARNATAKA

1. KAR/N/ANS	ANSHI NATIONAL PARK
2. KAR/N/BAND	BANDIPUR NATIONAL PARK
3. KAR/N/BANN	BANNERGHATTA NATIONAL PARK
4. KAR/N/KUD	KUDREMUKH NATIONAL PARK
5. KAR/N/NAG	NAGARAHOLE NATIONAL PARK (Nagarhole)**
6. KAR/S/ADI	ADICHUNCHANAGIRI SANCTUARY
7. KAR/S/ARA	ARABITHITTU SANCTUARY
8. KAR/S/BHA	BHADRA SANCTUARY
9. KAR/S/BIL	BILIGIRI RANGASWAMY TEMPLE SANCTUARY
10. KAR/S/BRA	BRAHMAGIRI SANCTUARY
11. KAR/S/CAU	CAUVERY SANCTUARY
12. KAR/S/DAN	DANDELI SANCTUARY
13. KAR/S/GHA	GHATAPRABHA SANCTUARY
14. KAR/S/MEL	MELKOTE TEMPLE SANCTUARY
15. KAR/S/MOO	MOOKAMBIKA SANCTUARY
16. KAR/S/NUG	NUGU SANCTUARY
17. KAR/S/PUS	PUSHPAGIRI SANCTUARY
18. KAR/S/RANE	RANEENNUR BLACK BUCK SANCTUARY
19. KAR/S/RANG	RANGANATHITTU SANCTUARY

20.	KAR/S/SHA	SHARAVATHI VALLEY SANCTUARY
21.	KAR/S/SHE	SHETTIHALLI SANCTUARY
22.	KAR/S/SOM	SOMESHWARA SANCTUARY
23.	KAR/S/TAL	TALKAVERI SANCTUARY

#### KERALA

1.	KER/N/ERA	ERAVIKULAM NATIONAL PARK
2.	KER/N/PER	PERIYAR NATIONAL PARK
3.	KER/N/SIL	SILENT VALLEY NATIONAL PARK
4.	KER/S/ARA	ARALAM SANCTUARY
5.	KER/S/CHIM	CHIMONY SANCTUARY
6.	KER/S/CHIN	CHINNAR SANCTUARY
7.	KER/S/IDU	IDUKKI SANCTUARY
8.	KER/S/NEY	NEYYAR SANCTUARY
9.	KER/S/PAR	PARAMBIKULAM SANCTUARY
10.	KER/S/PEE	PEECHI VAZHANI SANCTUARY
11.	KER/S/PEP	PEPPARA SANCTUARY
12.	KER/S/SHE	SHENDURNEY SANCTUARY
13.	KER/S/THA	THATTEKKAD SANCTUARY
14.	KER/S/WYN	WYNAD SANCTUARY

#### MAHARASHTRA

1.	MAH/N/NAW	NAWEGAON NATIONAL PARK
2.	MAH/N/PEN	PENCH NATIONAL PARK
3.	MAH/N/SAN	SANJAY GANDHI NATIONAL PARK
4.	MAH/N/TAD	TADODA NATIONAL PARK
5.	MAH/S/AND	ANDHARI SANCTUARY
6.	MAH/S/ANE	ANER DAM SANCTUARY
7.	MAH/S/BHI	BHIMASHANKAR SANCTUARY
8.	MAH/S/BOR	BOR SANCTUARY
9.	MAH/S/CHAN	CHANDOLI SANCTUARY
10.	MAH/S/CHAP	CHAPRALA SANCTUARY
11.	MAH/S/DEU	DEULGAON REHEKURI SANCTUARY
+++12.	MAH/S/DHA	DHAKNA KOLKAZ SANCTUARY
13.	MAH/S/GAU	GAUTALA AUTRAM GHAT SANCTUARY
14.	MAH/S/GRE	GREAT INDIAN BUSTARD SANCTUARY
15.	MAH/S/JAY	JAIKWADI SANCTUARY
16.	MAH/S/KAL	KALSUBAI HARISHCHANDRAGADH SANCTUARY
17.	MAH/S/KAR	KARNALA SANCTUARY
18.	MAH/S/KAT	KATEPURNA SANCTUARY
++19.	MAH/S/KIN	KINWAT SANCTUARY
20.	MAH/S/KOY	KOYNA SANCTUARY
21.	MAH/S/MAL	MALVAN (MARINE) SANCTUARY
22.	MAH/S/MEL	MELGHAT SANCTUARY
23.	MAH/S/NAG	NAGZIRA SANCTUARY
24.	MAH/S/NAN	NANDUR MADHMESHWAR SANCTUARY
25.	MAH/S/PHA	PHANSAD SANCTUARY
26.	MAH/S/RAD	RADHANAGARI SANCTUARY
27.	MAH/S/SAG	SAGARESHWAR SANCTUARY
28.	MAH/S/TAN	TANSA SANCTUARY
29.	MAH/S/YAV	YAVAL SANCTUARY

#### MANIPUR

1.	MAN/N/KEI	KEIBUL LAMJAO NATIONAL PARK
2.	MAN/N/SIR	SIROY NATIONAL PARK

## MEGHALAYA

- |              |                          |
|--------------|--------------------------|
| 1. MEG/N/BAL | BALPHAKRAM NATIONAL PARK |
| 2. MEG/N/NOK | NOKREK NATIONAL PARK     |
| 3. MEG/S/BAG | BAGHMARA SANCTUARY       |
| 4. MEG/S/NON | NONGKHYLLEM SANCTUARY    |
| 5. MEG/S/SIJ | SIJU SANCTUARY           |

## MIZORAM

- |              |                 |
|--------------|-----------------|
| 1. MIZ/S/DAM | DAMPA SANCTUARY |
|--------------|-----------------|

## MADHYA PRADESH

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|--------------|---|
| 1. MP/N/BAN  | BANDHAVGARH NATIONAL PARK (Bandhogarh)**    |
| 2. MP/N/FOS  | FOSSIL NATIONAL PARK                        |
| 3. MP/N/IND  | INDRAVATI NATIONAL PARK                     |
| 4. MP/N/KANG | KANGER GHATI NATIONAL PARK                  |
| 5. MP/N/KANH | KANHA NATIONAL PARK                         |
| 6. MP/N/MAD  | MADHAV NATIONAL PARK                        |
| 7. MP/N/PAN  | PANNA NATIONAL PARK                         |
| 8. MP/N/PEN  | PENCH NATIONAL PARK                         |
| 9. MP/N/SAN  | SANJAY NATIONAL PARK                        |
| 10. MP/N/SAT | SATPURA NATIONAL PARK                       |
| 11. MP/N/VAN | VAN VIHAR NATIONAL PARK                     |
| 12. MP/S/ACH | ACHANKMAR SANCTUARY                         |
| 13. MP/S/BAD | BADALKHOL SANCTUARY                         |
| 14. MP/S/BAG | BAGDARA SANCTUARY                           |
| 15. MP/S/BAR | BARNAWAPARA SANCTUARY                       |
| 16. MP/S/BHA | BHAIRAMGARH SANCTUARY (Wild Buffalo)**      |
| 17. MP/S/BOR | BORI SANCTUARY                              |
| 18. MP/S/GAN | GANDHI SAGAR SANCTUARY                      |
| 19. MP/S/GHA | GHATIGAON-GREAT INDIAN BUSTARD SANCTUARY    |
| 20. MP/S/GOM | GOMARDA SANCTUARY                           |
| 21. MP/S/KAR | KARERA-GREAT INDIAN BUSTARD SANCTUARY       |
| 22. MP/S/KEN | KEN GHARIAL SANCTUARY                       |
| 23. MP/S/KHA | KHARMORE SANCTUARY                          |
| 24. MP/S/KHE | KHEONI SANCTUARY                            |
| 25. MP/S/NAR | NARSINGGARH SANCTUARY (Narsighgarh)**       |
| 26. MP/S/NAT | NATIONAL CHAMBAL SANCTUARY                  |
| 27. MP/S/NAU | NAURADEHI SANCTUARY                         |
| 28. MP/S/PAC | PACHMARHI SANCTUARY                         |
| 29. MP/S/PAL | PALPUR KUND SANCTUARY                       |
| 30. MP/S/PAM | PAMED SANCTUARY                             |
| 31. MP/S/PAN | PANPATHA SANCTUARY                          |
| 32. MP/S/PEN | PENCH SANCTUARY (Location same as 8 on map) |
| 33. MP/S/PHE | PHEN SANCTUARY                              |
| 34. MP/S/RAT | RATAPANI SANCTUARY                          |
| 35. MP/S/SAI | SAILANA SANCTUARY                           |
| 36. MP/S/SAN | SANJAY (DUBRI) SANCTUARY (Dubari)**         |
| 37. MP/S/SEM | SEMARSOT SANCTUARY                          |
| 38. MP/S/SIN | SINGHORI SANCTUARY                          |
| 39. MP/S/SIT | SITANADI SANCTUARY                          |
| 40. MP/S/SON | SON GHARIAL SANCTUARY                       |
| 41. MP/S/TAM | TAMOR PINGLA SANCTUARY                      |
| 42. MP/S/UDA | UDANTI SANCTUARY                            |

**NAGALAND**

- |              |                     |
|--------------|---------------------|
| 1. NAG/S/FAK | FAKIM SANCTUARY     |
| 2. NAG/S/INT | INTANKI SANCTUARY   |
| 3. NAG/S/PUL | PULEBATZE SANCTUARY |

**ORISSA**

- |               |  |
|---------------|--|
| 1. ORI/N/SIM  | SIMLIPAL NATIONAL PARK                         |
| 2. ORI/S/BAI  | BAISIPALLI (MAHANADI) SANCTUARY                |
| 3. ORI/S/BAL  | BALUKHAND SANCTUARY                            |
| 4. ORI/S/BHI  | BHITTAR KANIKA SANCTUARY                       |
| 5. ORI/S/CHA  | CHANDKA DAMPARA SANCTUARY                      |
| 6. ORI/S/DEB  | DEBRIGARH SANCTUARY                            |
| 7. ORI/S/HAD  | HADGARH SANCTUARY                              |
| 8. ORI/S/KHA  | KHALASUNI SANCTUARY                            |
| 9. ORI/S/KOT  | KOTGARH SANCTUARY                              |
| 10. ORI/S/KUL | KULDIHA SANCTUARY                              |
| 11. ORI/S/LAK | LAKHARI VALLEY SANCTUARY                       |
| 12. ORI/S/NAN | NANDANKANAN SANCTUARY                          |
| 13. ORI/S/SAT | SATKOSIA GORGE SANCTUARY                       |
| 14. ORI/S/SIM | SIMLIPAL SANCTUARY (Location same as 1 on map) |
| 15. ORI/S/SUN | SUNABEDA SANCTUARY                             |

**PUNJAB**

- |               |                           |
|---------------|---------------------------|
| 1. PUN/S/ABO  | ABOHAR SANCTUARY          |
| 2. PUN/S/BIRB | BIR BUNNERHERI SANCTUARY  |
| 3. PUN/S/BIRG | BIR GURDIALPURA SANCTUARY |
| 4. PUN/S/BIRM | BIR MOTIBAGH SANCTUARY    |
| 5. PUN/S/HAR  | HARIKE LAKE SANCTUARY     |

**RAJASTHAN**

- |               |   |
|---------------|---|
| 1. RAJ/N/DES  | DESERT NATIONAL PARK                          |
| 2. RAJ/N/KEO  | KEOLADEO NATIONAL PARK                        |
| 3. RAJ/N/RAN  | RANTHAMBORE NATIONAL PARK                     |
| 4. RAJ/N/SAR  | SARISKA NATIONAL PARK                         |
| 5. RAJ/S/BHE  | BHENSRODGARH SANCTUARY                        |
| 6. RAJ/S/DAR  | DARAH SANCTUARY                               |
| 7. RAJ/S/JAI  | JAISAMAND SANCTUARY                           |
| 8. RAJ/S/JAM  | JAMVA-RAMGARH SANCTUARY                       |
| 9. RAJ/S/JAW  | JAWAHAR SAGAR SANCTUARY                       |
| 10. RAJ/S/KAI | KAILA DEVI SANCTUARY                          |
| 11. RAJ/S/KUM | KUMBHALGARH SANCTUARY                         |
| 12. RAJ/S/MOU | MOUNT ABU SANCTUARY                           |
| 13. RAJ/S/NAH | NAHARGARH SANCTUARY                           |
| 14. RAJ/S/NAT | NATIONAL GHARIAL SANCTUARY                    |
| 15. RAJ/S/PHU | PHULWARI SANCTUARY                            |
| 16. RAJ/S/RAM | RAMGARH SANCTUARY                             |
| 17. RAJ/S/SAR | SARISKA SANCTUARY (Location same as 4 on map) |
| 18. RAJ/S/SHE | SHERGARH SANCTUARY                            |
| 19. RAJ/S/SIT | SITA MATA SANCTUARY                           |
| 20. RAJ/S/TAL | TAL CHAPPER SANCTUARY                         |
| 21. RAJ/S/TOD | TODGARH RAOLI SANCTUARY                       |
| 22. RAJ/S/VAN | VAN VIHAR SANCTUARY                           |

## SIKKIM

- |              |                               |
|--------------|-------------------------------|
| 1. SIK/N/KHA | KHANGCHENDZONGA NATIONAL PARK |
| 2. SIK/S/FAM | FAMBONG LHO SANCTUARY         |
| 3. SIK/S/KYO | KYONGNASLA ALPINE SANCTUARY   |
| 4. SIK/S/SIN | SINGBA RHODODENDRON SANCTUARY |

## TAMIL NADU

- |              |                          |
|--------------|--------------------------|
| 1. TN/N/GUI  | GUINDY NATIONAL PARK     |
| 2. TN/N/MAR  | MARINE NATIONAL PARK     |
| 3. TN/S/ANA  | ANAMALAI SANCTUARY       |
| 4. TN/S/KAL  | KALAKAD SANCTUARY        |
| 5. TN/S/KAR  | KARIKILI SANCTUARY       |
| 6. TN/S/MUD  | MUDUMALAI SANCTUARY      |
| 7. TN/S/MUN  | MUNDANTHURAI SANCTUARY   |
| 8. TN/S/NIL  | NILGIRI TAHR SANCTUARY   |
| 9. TN/S/POI  | POINT CALIMERE SANCTUARY |
| 10. TN/S/PUL | PULICAT SANCTUARY        |
| 11. TN/S/VED | VEDANTHANGAL SANCTUARY   |
| 12. TN/S/VET | VETTANGUDI SANCTUARY     |

## TRIPURA

- |              |                      |
|--------------|----------------------|
| 1. TRI/S/GUM | GUMTI SANCTUARY      |
| 2. TRI/S/ROA | ROA SANCTUARY        |
| 3. TRI/S/SEP | SEPAHIJALA SANCTUARY |
| 4. TRI/S/TRI | TRISHNA SANCTUARY    |

## UTTAR PRADESH

- |              |  |
|--------------|--|
| 1. UP/N/COR  | CORBETT NATIONAL PARK                  |
| 2. UP/N/DUD  | DUDHWA NATIONAL PARK                   |
| 3. UP/N/NAN  | NANDA DEVI NATIONAL PARK               |
| +4. UP/N/RAJ | RAJAJI NATIONAL PARK                   |
| 5. UP/N/VAL  | VALLEY OF FLOWERS NATIONAL PARK        |
| 6. UP/S/ASK  | ASKOT SANCTUARY                        |
| 7. UP/S/BIN  | BINSAR SANCTUARY                       |
| 8. UP/S/CHA  | CHANDRAPRABHA SANCTUARY                |
| 9. UP/S/GOV  | GOVIND PASHUVIHAR SANCTUARY            |
| 10. UP/S/HAS | HASTINAPUR SANCTUARY                   |
| 11. UP/S/KAI | KAIMUR SANCTUARY                       |
| 12. UP/S/KAT | KATERNIAGHAT SANCTUARY                 |
| 13. UP/S/KED | KEDARNATH SANCTUARY                    |
| 14. UP/S/KIS | KISHANPUR SANCTUARY                    |
| 15. UP/S/MAH | MAHAVIR SWAMY SANCTUARY                |
| 16. UP/S/NAT | NATIONAL CHAMBAL SANCTUARY (Chambal)** |
| 17. UP/S/NAW | NAWABGANJ SANCTUARY                    |
| 18. UP/S/RAN | RANIPUR SANCTUARY                      |
| 19. UP/S/SAM | SAMASPUR SANCTUARY                     |
| 20. UP/S/SOH | SOHAGBARWA SANCTUARY                   |
| 21. UP/S/SON | SONANADI SANCTUARY                     |

## WEST BENGAL

- |             |                            |
|-------------|----------------------------|
| 1. WB/N/NEO | NEORA VALLEY NATIONAL PARK |
| 2. WB/N/SIN | SINGHALILA NATIONAL PARK   |

3. WB/N/SUN	SUNDERBAN NATIONAL PARK
4. WB/S/BAL	BALLAVPUR SANCTUARY
5. WB/S/BET	BETHUADAHARY SANCTUARY
6. WB/S/BIB	BIBHUTIBHUSAN SANCTUARY
7. WB/S/BUX	BUXA SANCTUARY
8. WB/S/CHA	CHAPRAMARI SANCTUARY
9. WB/S/GOR	GORUMARA SANCTUARY
10. WB/S/HAL	HALLIDAY ISLAND SANCTUARY
11. WB/S/JAL	JALDAPARA SANCTUARY
12. WB/S/JOR	JOREPOKHRI SANCTUARY
13. WB/S/LOT	LOTHIAN ISLAND SANCTUARY
14. WB/S/MAH	MAHANANDA SANCTUARY
15. WB/S/NAR	NARENDRAPUR SANCTUARY
16. WB/S/PAR	PARMADAN SANCTUARY
17. WB/S/RAI	RAIGANJ SANCTUARY
18. WB/S/RAM	RAMNABAGAN SANCTUARY
19. WB/S/SAJ	SAJNAKHALI SANCTUARY
20. WB/S/SEN	SENCAL SANCTUARY

NOTE: The underlisted sanctuaries figure in a list prepared by the Ministry of Environment and Forests, Government of India, but not in the lists sent to us by the respective State Governments. Their status, therefore, was unclear and their location unknown up to the finalisation of this report.

GOA/S/SAL	SALIM ALI SANCTUARY
J&K/S/HOK	HOKERSAR SANCTUARY
NAG/S/RAN	RANGAPAHAR SANCTUARY
RAJ/S/BAN	BANDH BARATHA SANCTUARY
RAJ/S/SAJ	SAJJANGARH SANCTUARY
RAJ/S/SAW	SAWAI MANSINGH SANCTUARY
SIK/S/MAE	MAENAM SANCTUARY

- + Rajaji National Park encompasses the former sanctuaries of Chilla, Motichur, and Rajaji.
- ++ Kinwat Sanctuary has been reconstituted as Painganga Sanctuary.
- +++ Dhakna Kolkaz Sanctuary has been reconstituted as Gugamal National Park.
- ^ Not shown in the map as their location could not be ascertained.
- # Location as per the map provided by the Andaman & Nicobar Islands Wildlife Wing.
- \* The exact location of these Parks/Sanctuaries is not known to us. These have therefore been marked in the map within the districts they are located in.
- \*\* The name/spelling given in brackets is also used for the park/sanctuary in some official documents.

The locations of the national parks and sanctuaries, as indicated on the map, are checked from one or more of the following sources:

1. *National Parks in India*, Survey of India map printed by SOI. Published under the direction of Major General Girish Chandra Agarwal in 1986.
2. *The Oxford School Atlas*, 25th edition 1982
3. *Road Map of India*, Survey of India.
4. *National School Atlas of India, Administrative*, Port Blair, plate 22, prepared under the direction of The National Atlas Organisation, Department of Science and Technology, Government of India, Calcutta. First edition 1977.
5. *Wildlife Sanctuaries of Andhra Pradesh*, AP. Forest Department Booklet (undated)
6. *Arunachal Pradesh, Assam, Manipur, Mizoram, Nagaland and Tripura*, Survey of India map, second edition.
7. *Directory of National Parks and Sanctuaries in India*, IIPA 1985.
8. *Dadar & Nagar Haveli, Gujarat and Maharashtra*, Survey of India map, first edition, 1985.
9. *Environment Conservation and Wildlife in Gujarat State*, Status Paper, Government of Gujarat (undated).

10. *Chandigarh, Delhi, Haryana, Himachal Pradesh and Punjab*, Survey of India map, 1984.
11. *Goa, Daman & Diu and Karnataka*, Survey of India, fourth edition, 1981.
12. *Forest Divisional Boundaries and Location of National Parks and Wildlife Sanctuaries* general map by the Kerala State Forest Department, (undated).
13. *Dadar & Nagar Haveli, Gujarat and Maharashtra*, Survey of India map, first edition, 1977.
14. *National Parks and Sanctuaries in Madhya Pradesh*, State Forest Department, Wildlife Wing (undated).
15. Map of Nagaland showing Tragopan Habitat, State Forest Department, (undated).
16. *Wildlife of Orissa 1986*, booklet, State Forest Department.
17. *Rajasthan*, Survey of India map, first edition, 1978.
18. *Wildlife Rajasthan*, booklet of Department of Tourism, Art and Culture, 1988.
19. *Sikkim*, Survey of India map, second edition, 1981.
20. *Kerala, Pondicherry, Tamil Nadu and Lakshadweep*, Survey of India map, second edition, 1980.
21. *Uttar Pradesh*, Survey of India map, first edition, 1975.
22. *West Bengal*, Survey of India map, first edition, 1971.
23. *India's Wildlife and Wildlife Reserves*, B. Seshadri, Sterling Publishers Pvt. Ltd., 1986.
24. *Planning a Wildlife Protected Area Network in India (Vol. II): State Summaries*, Rodgers, W.A. and Panwar, H.S., Wildlife Institute of India, Dehradun, 1988.
25. *National Parks and Sanctuaries in Maharashtra*, map published by the Additional Chief Conservator of Forests, Nature Conservation, M.S., Nagpur (undated).
26. *National Parks and Wildlife Sanctuaries in Karnataka*, map published by the Karnataka Forest Department, Wildlife Wing (undated).
27. *Tourist Map of Orissa*, Survey of India, Bhubaneswar, 1986.
28. Map of Bay of Bengal, India - Andaman Islands; *Landfall I. to Stewart Sound*, Sheet No. 402, 1972; *Stewart Sound to Eliphinstone HR*, Sheet No. 403, 1973; *Eliphinstone Harbour to Port Blair*, Sheet No. 404, 1972; *Port Blair to Little Andaman I.*, Sheet No. 405, 1976, Naval Hydrographic Office, Dehra Dun.
29. Map of Bay of Bengal, India - Nicobar Islands; *Chowra I. to Nancowry HR*, Sheet No. 408, 1976, Naval Hydrographic Office, Dehra Dun.
30. Map of Andaman Sea - India; *Plans in Nicobar Islands*, Sheet No. 4004, 1983. Naval Hydrographic Office, Dehra Dun.
31. Map sent by Chief Wildlife Warden, Haryana, 1989.

## Introduction

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India's success in rapidly expanding its network of wildlife protected areas since Independence, and especially in the last 25 years, has been quite extraordinary. From a modest 65 national parks and sanctuaries in 1960, at the start of 1989 there are 445 such areas, and the number is daily growing. Considering the numerous other pressures on our lands and forests, this achievement of the state governments and the Government of India is remarkable.

Much of this has been achieved because of the concerted efforts of government functionaries: prime ministers who repeatedly urged chief ministers to give more attention to wildlife protection, Central Government officials and officials at the state headquarters who energetically pursued the matter with each other, and field officers who enthusiastically identified, and jealously guarded, the few remaining pockets of wilderness.

The role of non-governmental organisations and individuals, in this effort at slowly and painstakingly turning around the headlong rush to ecological disaster, is equally significant. Whatever else might or might not have been achieved, at least the need and urgency to bring more and more natural areas under protection has been accepted as a priority for the nation.

Yet much still needs to be done. Though the acceptance of the need for a protected area network, and its establishment and growth, are important, they are only a first step. We have to increasingly look at the pressures these protected areas are facing and the problems involved in managing them.

It seems that the major hurdle in the protection of Indian wildlife today is the reconciliation of short-term human interests with the interests of fauna and flora. These interests are seen to be, and sometimes are, contradictory. With the increasing growth of human population and the progressive decrease of wilderness areas, this conflict of interests is becoming more and more visible, and more and more difficult to resolve.

The full and long-term resolution of this conflict requires systemic changes far beyond the realm of wildlife management, and of this report. However, the report seeks to explore the possibilities of minimising this conflict within the framework of wildlife management, although partially and for a short while. It also seeks to raise some of the larger issues that need to be discussed nationally.

It must be stressed at the outset that our recommendations, as indeed our 'findings', are not intended as final and conclusive pronouncements. They are put forward as tentative first steps towards a better understanding of our natural heritage. If it was not for the urgency to highlight the various management problems in our national parks and sanctuaries, and the almost total lack of

information on these, we would not have had the temerity to say even the little that we have.

While we have pointed out a number of serious shortcomings in the management of protected areas in India, it is *not* the purpose of this report to belittle the efforts of wildlife personnel working in the states and at the Centre. Nor is it to imply that what we see as failures in the proper management of parks and sanctuaries are wholly or even primarily theirs. Our parks and sanctuaries and the staff protecting them are subjected to many socio-economic and political pressures; these, along with the non-completion of legal procedures by the district authorities, make the management of these areas a difficult task. In fact, we would like to put on record our happy experience of meeting with a large number of exceptionally sincere and dedicated wildlife officials.

It is also *not* intended to imply that no purpose is being served by declaring new areas as national parks and sanctuaries. Despite the many problems, we believe that very many more areas need to be added to the protected areas network. This is partly because we believe that the poor management of our parks and sanctuaries is not because there are too many of them, but perhaps because of distortions in our planning process and our inappropriate priorities. As these have no necessary relationship to the number of parks and sanctuaries that exist, and as even with the present problems a wilderness area is far more likely to survive if it is notified as a park or sanctuary, there seem to be good reasons to set up more protected areas to form a truly comprehensive network.

Finally, it must also be stressed that we do not think it desirable, or even possible, to promote wildlife conservation at the cost of social and human interests. However, we think that in most instances where conflicts are sought to be presented as those between human interests and wildlife interests, they are actually conflicts between two or more classes of human beings. Perhaps it is because some people want everything for themselves that most are left without anything and are forced to grab from those even weaker than themselves: the animals. Seeming conflicts, therefore, must be properly analysed and in resolving them it should be remembered that apart from the dependence that humankind has on plants and animals, these plants and animals also have a right of their own to live. Even if human sensitivity has not yet developed to a level where this can be universally accepted, and we continue to put our needs first without even considering theirs, surely we ought not to make them victims of the totally unjustifiable greed of a few.

## BACKGROUND TO THE REPORT

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This report contains the major findings and recommendations arising out of a study sponsored by the Department of Environment, Government of India, at the behest of the National Committee for Environmental Planning (as it was then known). In 1984 two questionnaires (I and II) were dispatched: questionnaire I to be filled in by the Director of each national park or

sanctuary, and questionnaire II by the Chief Wildlife Warden of each state or union territory. Subsequently, a third questionnaire was designed for non-governmental organisations (NGOs) and conservationists.

Based on these completed questionnaires, a preliminary *Directory of National Parks and Sanctuaries in India* was brought out in February 1985. This was followed by two checklists (of 95 and 50 management indicators) on each park and sanctuary, for use by the Ministry of Environment and Forests and the Prime Minister's Office (December 1985 and March 1986). This is the final report of this study, even though the data generated by the study will continue to be used for other ongoing and related studies.\*

## OBJECTIVES

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The objectives of this study were:

- To document, analyse and make public information on some of the laws, policies, practices, and problems relevant to the management of protected areas in India
- To make recommendations aimed at improving the management of protected areas in India
- To document and make public information on the flora, fauna and habitat of these protected areas

For purposes of determining the state of management, various indicators were used, broadly falling under the heads of legal status and procedures, policy and planning, management practices, and management facilities.

In order to properly understand the context within which management has to take place, a chapter each on Human Activities and on Fauna, Flora and Habitat have been provided in the report. These, in a sense, define the limits within which the park manager must function, and in themselves pose the problems that conservation policy and planning must seek to solve.

## METHODOLOGY

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The information presented in this report is mostly based on the questionnaires (questionnaire I) returned prior to January 1, 1987. At that time 51 national parks and 242 sanctuaries, a total of 293, had been declared in India, of which 249 had responded by sending in their filled questionnaires (see Annexure 1a for list). It is from these 249 that the data for most of this report are culled.

Since January 1, 1987 and till March 1989, another 152 national parks and sanctuaries have been set up in India, making a total of 445 (see p.xiii for

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\* Work is in progress at the IIPA on producing directories of national parks and sanctuaries, and on a detailed study of the management of national parks.

full list).<sup>\*</sup> In this period a few more completed questionnaires have been received and the larger data base now available (from 261 parks and sanctuaries; see Annexure 1b for list) has been used for only some parameters in this report (e.g., sections II:1.1 to II:1.3, on topography, climate and forest types, and sections III:1.1 and III:1.3, on human and cattle densities); where used, it is indicated by the phrase '*extended data base*'.

Till date about 150 national parks and sanctuaries have been field-visited by project personnel. The task of visiting the remaining areas is continuing.

The reasons why it has been thought fit to publish these data without waiting for all the parks and sanctuaries to respond and without waiting for field visits to be completed for all the areas are:

- A large part of the information given in this report is such that its significance is not likely to alter after the remaining areas have responded or after the field visits have been completed. For example, the data given show that only 8% of the sanctuaries responding have taken all the legal steps required to identify and settle rights under the Wild Life (Protection) Act, 1972. Even if additional responses and field visits alter this to, say, 20%, the fact still remains that something is seriously wrong either with the prescribed legal steps or with the way they are being followed.
- Though we intend to produce another report incorporating detailed information for all the areas, it is expected that field visits and the completion of questionnaires for the remaining parks and sanctuaries might take a fairly long time. It was felt that the data in hand should be made public as soon as possible so that remedial action, wherever required, could be initiated without unnecessary delay. This would also enable researchers, officials, and activists to use this database.

The number of parks and sanctuaries responding differs from question to question, either because all those responding have not answered all questions, or because, in some cases, their responses to particular questions have not been comprehensible.

Assam, Chandigarh, Mizoram and Punjab had, till January 1987, not returned any questionnaires. No data pertaining to these states/union territories have been presented here, except very general data available from other sources.

## TIME FRAME

The time frame of the data presented is, in most cases, April 1, 1979 to March 31, 1984. Exceptions to this, e.g., questions like fauna introduction and reintroduction, are indicated in the relevant table and text.

<sup>\*</sup> Of the 131 new parks and sanctuaries, 85 sanctuaries have been declared in the Andaman and Nicobar Islands alone. Most of these are tiny islands, without human population, about which little or no information exists beyond their size and location.

## STATUS OF THE DATA

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*It must be stressed that the data presented here are a reproduction of the data sent in by the national park or sanctuary authorities. They have not been independently verified. While about a third of the parks and sanctuaries have been visited, their selection has not been done on the basis of random sampling and, therefore, without completion of the field visits to all parks and sanctuaries, it would not be methodologically appropriate to include the data thus collected for only some of the areas. However, on the basis of the field visits conducted so far, an understanding has been obtained on some of the biases in the data—this understanding has been reflected, as far as possible, under the heading 'Limitations of the Data' given for most of the sections.*

## INTERPRETATION OF DATA

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Though information was, where relevant, sought and obtained separately for core zone and buffer zone, it has been presented here for the area as a whole, unless otherwise specified in the tables or text. However, as only 38% of the national parks and 19% of the sanctuaries responding reported zoning, (see section IV: 1.3) this might not be a serious shortcoming.

## THE WILD LIFE ACT

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The Wild Life (Protection) Act, 1972 has been referred to as the basic Act for national parks and sanctuaries. However, one state, Jammu & Kashmir, has its own Wild Life Protection Act which is the basic Act for its national parks and sanctuaries. No separate reference has been made to this Act as, for the aspects discussed in this report, it does not differ from the national Act.

## CODES

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The names of states and union territories have been abbreviated in the tables. Similarly, each national park and sanctuary has a unique code consisting of three elements as follows.

- The first 2 or 3 letters denote the state, e.g., MP for Madhya Pradesh and RAJ for Rajasthan.
- The next letter denotes whether the area is a national park (N) or sanctuary (S).
- The next 3 or 4 letters denote the first 3 or 4 letters of the first word in the name of the park/sanctuary, e.g., RAJ/N/KEO denotes the Keoladeo Ghana National Park in Rajasthan. (Where the first 3 letters of the first word are identical for two or more parks/sanctuaries in a given state, a fourth letter has been used.)

A complete list of the parks and sanctuaries, giving expansion of the codes, is given on p. xiii.

## TABLES

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Data for each section of the report are displayed mainly in a table labelled to correspond to the section. Explicit references to the table are not usually placed in the text. These tables are located at the end of the report. Most of the tables contain statewide data separately for national parks and sanctuaries and also the total for the state.

Wherever there is a blank under a relevant head in any table it means that information is not available from the questionnaire and may not be available with the park/sanctuary authorities.

For some of the sections, no tables have been provided and data have been given as a part of the write-up. This is usually because data for that section were too scanty to justify presentation in tabular form. In all such cases it has been mentioned with the section title that there is no table.

The table number on the left hand top corner of each table represents the chapter, part and section number of this report and corresponds to the number of the section where data from that table are discussed. For example, Table II:2.3 gives data which support Chapter II, part 2, section 3 of the report.

All percentages in the tables and text have been rounded off, except in the few cases where decimals have been mentioned as they are considered significant.

## I. Legal Status

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It was only in 1972 that a unified national act came into being under which areas could be constituted and managed as national parks, sanctuaries, game reserves and closed areas. Entitled the Wild Life (Protection) Act, 1972, (hereafter called the Act), this act was adopted by all states except Jammu and Kashmir, which has its own act differing in certain respects from the national act.

Before the enactment of a national act, some states had their own legislations (e.g., the Hailey National Park Act of UP, 1936, under which the present Corbett National Park was set up as the Hailey National Park). The provisions in the Indian Forest Act of 1927, which allow the setting up of wildlife sanctuaries, were also invoked prior to the passing of the Wild Life (Protection) Act of 1972. (For details of wildlife legislation in India and related topics, see Annexure 5; for the chapter of the Wild Life Act relevant to national parks and sanctuaries, see Annexure 2.)

The present Act not only specifies the procedures to be followed in setting up national parks, sanctuaries, game reserves and closed areas (the last two not relevant to this report), but also specifies the management parameters by indicating the sorts of activities that are allowed or forbidden in such protected areas. The Act also lists the powers and functions of various officials, and the procedures and considerations relevant to the allowing or disallowing of diverse uses of national parks or sanctuaries.

*National parks* are given a higher level of protection, considering no grazing is permitted within them and it is specified that

No person shall destroy, exploit or remove any wild life from a National Park or destroy or damage the habitat of any wild animal or deprive any wild animal of its habitat within such National Park except under and in accordance with a permit granted by the Chief Wild Life Warden and no such permit shall be granted unless the State Government, being satisfied that such destruction, exploitation or removal of wild life from the National Park is necessary for the improvement and better management of wild life therein, authorises the issue of such permit. (Section 35(6) of the Act)

Also, no private land holding or right is allowed within a national park.

*Sanctuaries* are accorded a lesser level of protection, for in sanctuaries certain types of activities might be permitted not only 'for the better protection of wildlife', but also 'for any other good and sufficient reason'.

Notwithstanding anything contained elsewhere in this Act, no person shall hunt any wild animal in a sanctuary or remove therefrom any wild animal, whether alive or dead, or any trophy, uncured trophy, or meat derived from such animal;

Provided that if the Chief Wild Life Warden is satisfied that it is necessary that any wild animal in a sanctuary should be hunted or removed;

- (a) for the better protection of wild life, or
- (b) for any other good and sufficient reason,

he may, with the previous approval of the State Government, grant a permit authorising any person to hunt or remove such wild animal under the direction of an officer authorised by him or cause it to be hunted or removed. (Section 29(1) of the Act)

The Chief Wild Life Warden shall be the authority who shall control, manage and maintain all sanctuaries and for that purpose, within the limits of any sanctuary,

- (a) may construct such roads, bridges, buildings, fences or barrier gates, and carry out such other works as he may consider necessary for the purposes of such sanctuary;
- (b) shall take such steps as will ensure the security of wild animals in the sanctuary and the preservation of the sanctuary and wild animals therein;
- (c) may take such measures, in the interests of wild life, as he may consider necessary for the improvement of any habitat;
- (d) may regulate, control or prohibit, in keeping with the interests of wild life, the grazing or, movement of cattle;
- (e) May regulate, control or prohibit, any fishing. (Section 33 of the Act)

The Act further says that "'wild life" includes any animal, bees, butterflies, crustacea, fish and moths; and aquatic or land vegetation which forms part of any habitat'. (Section 2(37) of the Act)

The procedures specified in the Act for the setting up of national parks and sanctuaries (see Annexure 2) have the following broad objectives.

- To identify the extent and boundary of the park or sanctuary.
- To determine rights, if any, that exist within such an area. (To be done by the Collector, or an officer appointed specially for the purpose by the state government.)
- In the case of existing rights, to either compensate the owner of such rights, if the owner is agreeable, or to acquire the land or such rights, where the owner is not willing to voluntarily accept compensation.
- To exclude areas where unacceptable levels of disturbance exists, and where the disturbance cannot be satisfactorily stopped.
- To allow the continuation of those activities which are considered acceptable.
- To provide for alternatives to public way, or a common pasture, 'as far as may be practicable or convenient.' (Section 25(1) (f) of the Act)

This chapter deals with the legal status of national parks and sanctuaries, in terms of their declaration, the completion of legal procedures and addition to or deletion from their area.

Part I:1 deals with the legal steps regarding the setting up and control of national parks and sanctuaries, and part I:2 deals with changes in their area.

## **I:1 LEGAL STEPS**

The procedure for setting up a national park differs from the procedure for setting up a sanctuary. In the case of sanctuaries, an area is first declared a sanctuary (Section 18 of the Act). Then other steps are taken to determine, extinguish, acquire or otherwise adjust existing rights (Sections 19 to 26 of the Act). This ensures that only those activities are allowed in a sanctuary which are considered compatible with the interests of wildlife protection.

For national parks, the intention to constitute an area into a national park is first declared (Section 35 of the Act) and then all the steps prescribed for a sanctuary are followed. After the completion of these steps, the area is declared a national park through a notification (Section 35(4) of the Act).

This procedural difference has an important consequence. A protected area is legally *not a national park* until the final notification under Section 35(4) of the Act, has been issued. On the other hand, an area becomes a *sanctuary* upon declaration (under Section 18) even though various rights and leases have still to be settled. In both cases, of course, completion of the specified procedures is essential for proper management of the area, but in addition it is necessary for the very creation of a national park.

Table I:1, derived from the extended data base, shows the status of each responding national park and sanctuary with respect to the completion of legal procedures. *It seems that only 21 (40%) of the 52 national parks responding have completed their legal procedures.* Significantly, this means that only 21 of the 52 parks are legally national parks.

For sanctuaries the situation is somewhat more complicated, for there is no final notification to be issued (as in national parks), and they are legally constituted sanctuaries as soon as they are notified. Since the legal steps to be taken for identifying and excluding rights are taken subsequent to the notification of the sanctuary, these steps can be considered to be satisfactorily completed under any one of the following three circumstances.

- (i) If, subsequent to the Collector's proclamation calling for the preferring of rights (Section 21 of the Act, and legal step 3 in the table), no rights are preferred, found existing, or admitted, for the sanctuary.

Three of the responding sanctuaries fall into this category. They are Itanagar (ARU), Hingolghadh (GUJ), and Gandhi Sagar (MP).

- (ii) If all the rights admitted are excluded or acquired (Section 24 of the Act, and legal steps 7 to 12 in the table).

*None* of the responding sanctuaries fall into this category.

- (iii) For sanctuaries declared prior to the enactment of the Wild Life (Protection) Act, under any other act, if no rights exist in this sanctuary, even though the steps prescribed under the Wild Life (Protection) Act have not been followed (Section 66(3) of the Act).

Thirteen of the responding sanctuaries fall into this category. They are: Bondla and Cotigao (GOA); Nalsarovar (GUJ); Sultanpur (HAR); Black Buck (Ranebennur) (KAR); Dhakna Kolkaz, Kinwat and Radhanagari (MAH); Tal Chapper and Van Vihar (RAJ); Vedanthangal (TN); Chandraprabha (UP); and Jaldapara (WB).

In the case of five other sanctuaries, information regarding the existence of rights was not available and it could not therefore be determined whether they have completed all the legal steps or not. *From the above analysis it appears*

that only 16 (8%) of the 209 sanctuaries responding had completed their legal procedures.

However there is one further complication. For some sanctuaries it was stated by the wildlife authorities that the areas declared as sanctuaries were earlier reserve forests and therefore the need was not felt to go through the entire procedure laid down in the Act, for a similar procedure had to be followed before declaring the area a reserve forest. The Act, unfortunately, does not allow for such exceptions, and even areas that were previously reserve forests have to follow the legal steps laid down. Such sanctuaries, therefore, have been considered as not having completed their legal procedures. (For details regarding the existence of rights in sanctuaries, see section III:1.2.)

Information was also obtained on the amount of time it took to complete the legal procedures, for national parks. This is presented below for those states which responded.

State	No. of parks responding	Avg. time taken from step 1 to completion (months)	Range (months)
GUJ	3	8	5-30
J&K	1	0	0
KAR	1	97	97
MAN	1	17	17
MP	1	43	43
RAJ	1	5	5
UP	3	18	9-25
WB	1	72	72
India	12	37.5	5-97

The above data show that on an average, it took over 3 years after declaration of intent of national parks (step 1) to complete their legal procedures: the quickest reported was 5 months, the slowest 8 years and 1 month.

## I:2 ALTERATION OF BOUNDARIES

Alteration of the boundaries of a national park is allowed vide Section 35(5) of the Act, which specifies that a resolution of the state legislature is required for any such alteration. For sanctuaries, Section 24:2(a) of the Act provides for deleting portions of the notified area.

Additions to the area of parks and sanctuaries are usually aimed at making the existing area more ecologically viable, or to bring under protection a contiguous area of ecological significance. The migratory paths of certain wild animals may be added so as to ensure their protection over their entire range. Areas may also be added to act as a buffer to the existing area.

Deletion of an area, on the other hand, is usually a way of eliminating or reducing pressures detrimental to the well-being of the park. An area with intense human pressure, or an area where there are difficulties in acquisition of

land or extinguishing of rights can often be excluded to safeguard the overall interests of the park or sanctuary.

Details of alteration of area were obtained from national parks and sanctuaries. 9 (26%) of the 35 national parks and 16 (9%) of the 179 sanctuaries responding, reported some alteration. Of the parks which have had such a change, there has been addition of area in 6 and deletion in 5 —this includes 2 parks in which area was both added and deleted. Of the 16 sanctuaries reporting alteration, 10 reported an addition of area and 6 a deletion.

Information on the reasons for the alterations in these parks and sanctuaries was generally unclear, and hence has not been presented here. However, from the few clear answers obtained, it seems that the predominant reason for addition of area is to make the protected area ecologically more viable. Deletion of area was usually done due to failure to settle or extinguish local private rights over the area in question.

#### *Limitations of the Data*

The data reflect only formal alterations of boundary and do not include information concerning areas still to be acquired or under illegal occupation. Many of the parks and sanctuaries have reported such areas. Though areas still to be acquired or under illegal occupation are a part of the park or sanctuary, in practice they are not under the control of park authorities and, as such, for the purposes of management can be considered as deleted areas till such time as they are acquired or the encroachments are cleared.

As is shown in part I:1, only 8% of the sanctuaries and 40 % of the national parks responding have completed their legal procedures. This means that many of the parks and sanctuaries may still have their boundaries altered when the legal procedures are completed.

## II. Fauna, Flora and Habitat

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'... Protecting, propagating or developing wild life or its environment' (Section 18(1) of the Act) is considered to be the primary function of national parks and sanctuaries, and the reason for setting them up. In determining the areas suitable for such protection, factors such as their biological diversity, habitat representativeness, uniqueness and continuing viability are therefore considered. The type and status of the fauna and flora also figure in defining the management parameters for the area: the level of protection required, the human and physical inputs needed, etc.

Unfortunately, we still do not have any system by which the fauna and flora of a park or sanctuary are monitored, or even comprehensively listed. The park authorities do not have the staff or requisite facilities to take up this task. Though the Botanical Survey of India (BSI), the Zoological Survey of India (ZSI) and other such agencies have been engaged in biological studies, very few of the parks and sanctuaries have been covered so far.

It is, therefore, inevitable that not much information is available on fauna and flora for most of the areas. The little that is available is mainly the result of special efforts made by the local officers, or by interested agencies and conservationists, both governmental and non-governmental.

This chapter is divided into two parts: general description of the fauna, flora and habitat; and factors affecting the habitat, like floods, forest fires, droughts, water-logging and so on.

### II:1 GENERAL DESCRIPTION

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Information was sought regarding the following:

- topography (average height and highest and lowest points); climate (highest, lowest and average seasonal temperatures, average rainfall and rainy months)
- vegetation types (both extent and occurrence of forest types as per the revised classification of Champion and Seth, 1968)
- a checklist of tree species
- water resources (different types of water bodies, natural and artificial, perennial and seasonal, and for use by wildlife, livestock and humans)
- faunal species (checklist of important species of mammals, birds, reptiles, insects, amphibia and fish, especially those mentioned in Schedule I and Part II of Schedule II of the Wild Life (Protection) Act, specifying estimated population and occurrence, year of estimate and basis of estimate)

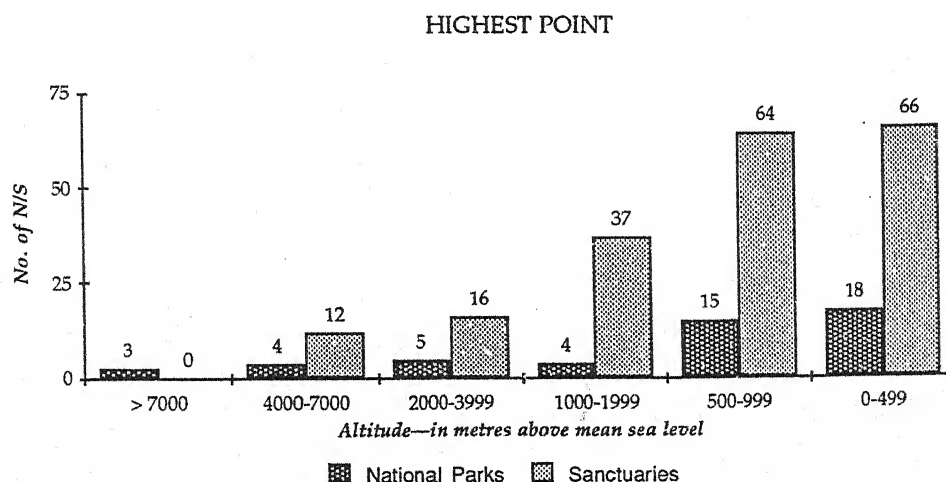
- floral species (apart from trees and forest types mentioned earlier, a listing of plant species of special interest, especially rare or endangered)
- some other elements of the habitat (e.g., link with other protected areas through forest corridors)

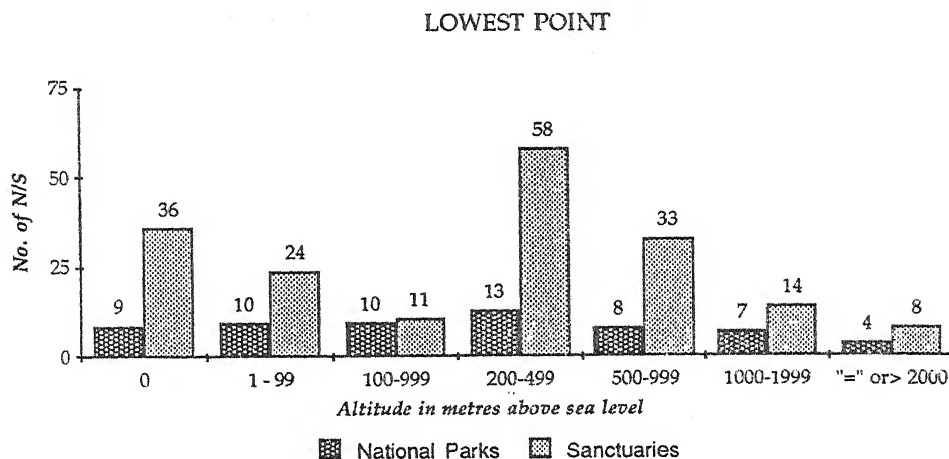
On the basis of information received from the parks and sanctuaries, presented below is a general idea of the forest types, faunal species, temperatures, altitudes, rainfall, and the existence of forest corridors between protected areas. Data received for the other aspects mentioned above were too scanty to be presented here.

### II:1.1 Topography (Altitude)

Of the national parks and sanctuaries surveyed, 223 indicated their highest points and 221 their lowest points (extended database). The complete information obtained is presented in Tables II:1.1a and II:1.1b. The range of altitudes (0 to 8585 m) reported represents the varied topography of the country. Nanda Devi National Park in UP (7817 m) and Kishtwar National Park in J&K (7100 m) have high points above 7000 metres and indeed, one, Khangchendzonga National Park (SIK) reaches 8585 metres above sea level, qualifying as the highest among the national parks and sanctuaries in India.

The number of national parks and sanctuaries in various altitudinal ranges is given below:





Some of the protected areas reported great variations in altitude within their boundaries. Khangchendzonga National Park (Sikkim), for instance, has a massive difference of 6756 metres between its lowest and highest points. Others with major altitudinal variations are: Kishtwar National Park, J&K (5400 m); Govind Pashuvihar Sanctuary, UP (5015 m); Great Himalayan National Park, HP (4640 m); Rupi Bhaba Sanctuary, HP (4435 m); and Namdapha National Park, ARU (4300 m).

#### *Limitations of the Data*

Though, theoretically, 1:50,000 Survey of India toposheets are available for all the areas where there are national parks and sanctuaries, in many cases it was discovered that the park or sanctuary authorities did not have access to these. As a result, an indeterminate number of the altitudes given are possibly not exact.

While many parks and sanctuaries reported a lowest altitude of zero metres above sea level, in truth some of them would actually have low points below this as they include parts of the sea and the sea bed. This, for instance, would be true of the Marine National Parks in the Andaman Islands and the Gulf of Kutch, Gujarat.

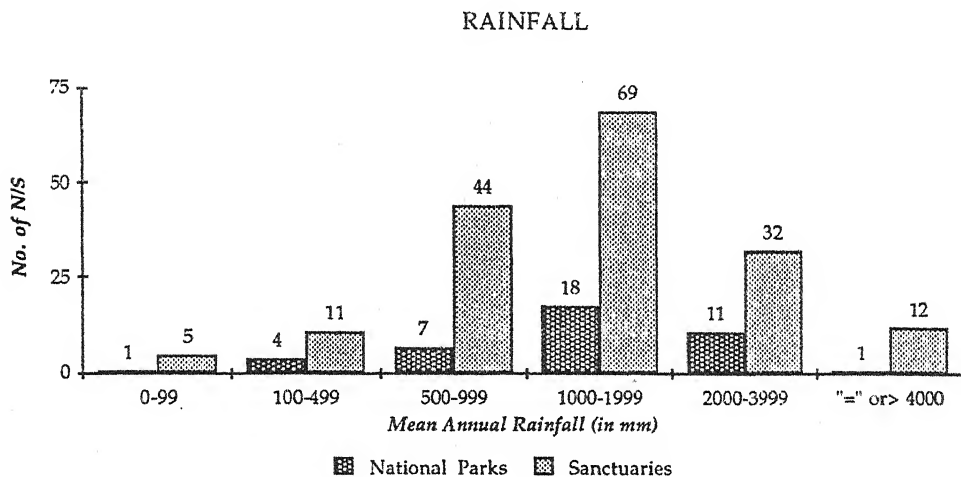
### II:1.2 Climate

Information was obtained on the average annual rainfall and the maximum and minimum temperatures recorded in each national park and sanctuary.

**Average Annual Rainfall:** 42 national parks and 171 sanctuaries sent in information on average annual rainfall (extended data base). Data for each area are reproduced in Table II:1.2a, with the areas arranged in ascending

order according to the rainfall figure reported. It can be seen that the range of rainfall between areas is quite large, as is to be expected in a situation where parks and sanctuaries are scattered all over a diverse physiographic unit such as India. Thus average annual rainfall ranges from a meagre 23 mm in the cold desert of Lippa Asrang Sanctuary (HP) to 5500 mm in the parks and sanctuaries of Goa.

Further analysis of the data in the table presents the following picture on the ranges of average rainfall recorded from India's protected areas:

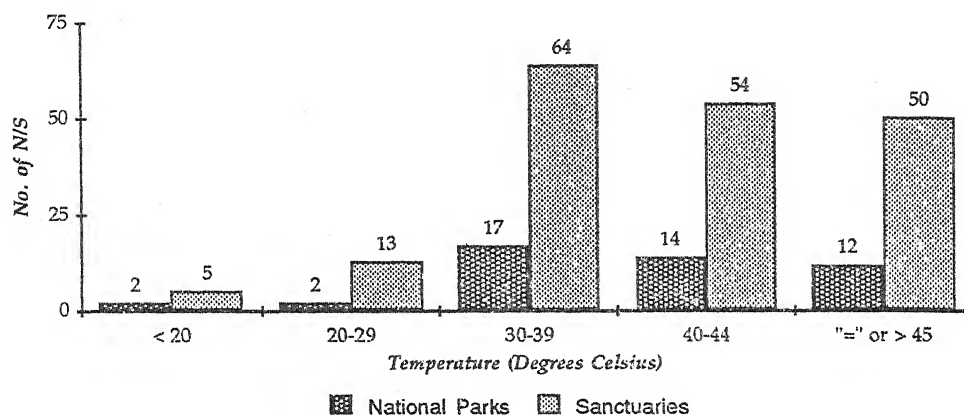


**Temperature:** 7 national parks and 186 sanctuaries sent in data about maximum temperature recorded, while 45 national parks and 175 sanctuaries reported the minimum temperature recorded. The two sets of data, both obtained from the extended data base, are reproduced separately in Tables II:1.2b and II:1.2c.

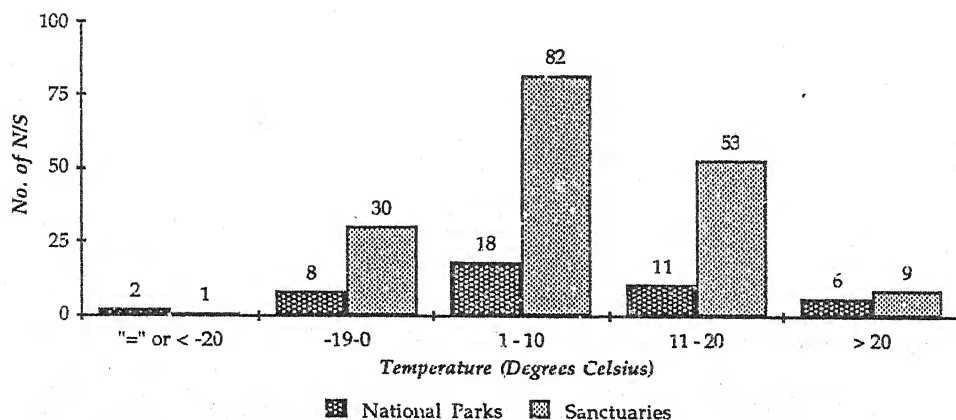
As in the case of average rainfall, the range of temperatures reported is very large, from a below freezing minimum of  $-40^{\circ}\text{C}$  in J&K's Hemis National Park as well as in Lungnag Sanctuary, to a searing  $50^{\circ}\text{C}$  in Desert National Park (RAJ). Such huge variations in temperature were reported not only *between* areas but also *within* them. For instance, Hemis National Park (J&K) has a difference of  $65^{\circ}\text{C}$  between its maximum and minimum temperatures, as does Lungnag Sanctuary (J&K).

The number of national parks and sanctuaries falling in different temperature ranges is given below:

## MAXIMUM TEMPERATURE



## MINIMUM TEMPERATURE

*Limitations of the Data*

While giving a good idea of the wide ranges of climatic conditions present in our parks and sanctuaries, the usefulness of the information presented is severely restricted by a number of factors. These are:

- Field visits have revealed the absence of meteorological stations or recording equipment *inside* many parks and sanctuaries. The meteorological data for such areas seems to have been gleaned from records available from

stations situated *outside*. While this may give a representative picture in those areas where local climatic variations are not significant, it is obviously inaccurate in other cases.

- Even where meteorological records are based on measurements taken *inside* the protected area, where local variations are great these records may be accurate for only a part of the area. This, for example, may be why Khangchendzonga National Park, with the third highest peak in the world, reported a minimum temperature of only  $-4.2^{\circ}\text{C}$ . The minimum temperature on top of the peak is likely to be much lower.
- There is little indication of the time period covered by the data presented. This was perhaps a fault in the questionnaire, since the year or period of the data reported was not asked for. It is possible that some areas reported data available for the last few years, while others sent information dug out of records several decades old. An example is Pench Sanctuary (MP), which reported a 1937 record of  $3.8^{\circ}\text{C}$  as the minimum temperature.
- In the case of average rainfall records from high altitude areas, the information may be misleading as it does not include snow precipitation. Again, this was due to faulty questionnaire design in that snowfall figures were not asked for separately.

### II:1.3 Forest Types

Several alternative approaches are available, or are being developed, for classification of natural ecosystems. There is now an increasing acceptance of biogeographic along with vegetational classifications of areas as a starting point for the planning of a protected area network. A classification of biogeographic realms, provinces and biomes is being elaborated for Indian application at the Wildlife Institute of India. In terms of pure vegetational mapping, the most recent classifications are those of Meher-Homji and others of the French Institute, Pondicherry (Gadgil et al., 1986). The present study, however, uses the *Revised Classification of Forest Types* by Champion and Seth (1968) as this is the vegetational classification currently most widely used in India and therefore most familiar to park managers (see Annexure 4 for Champion and Seth's detailed classification). As will be noticed, this divides India's forests into 16 major groups (e.g., Group 3 Tropical Moist Deciduous Forests), which in turn are divided into sub-groups (e.g., Sub-group 3B Andamans Moist Deciduous Forests), themselves further divided into types (e.g., 3B/C1 Moist Teak-bearing Forest, or further, 3B/C1a Very Moist Teak Forest). Of these, the unit most commonly used for categorisation is 'type'.

India has a great variety of forest types, many of which are represented in its parks and sanctuaries. Most parks and sanctuaries in fact contain more than one type of forest, some having over half a dozen.

*Information on forest types was available for 46 national parks and 223 sanctuaries.* (Note: this includes data from Assam, Chandigarh and Mizoram, obtained separately from the wildlife authorities of these states.) The complete list of types is reproduced in Table II:1.3. As can be seen, many of

Champion and Seth's types are represented in one or more of these protected areas. In addition, many areas reported their habitats to be 'wetland' type.

Some of the parks and sanctuaries reported a great diversity of forest types. Kedarnath Sanctuary (UP) recorded as many as 22 types, by far the area with greatest vegetational diversity reported. Dachigam National Park (J&K) and Manas Sanctuary (ASS) are other areas reporting significant diversity.

Further analysis of the data reveals the following incidence of the 16 major groups of forests identified by Champion and Seth:

S.No.	Forest Group	No. of N/S
1.	Tropical Wet Evergreen	34
2.	Tropical Semi-Evergreen	47
3.	Tropical Moist Deciduous	82
4.	Littoral and Swamp	35
5.	Tropical Dry Deciduous	129
6.	Tropical Thorn	18
7.	Tropical Dry Evergreen	2
8.	Subtropical Broadleaved Hill	16
9.	Subtropical Pine	11
10.	Subtropical Dry Evergreen	2
11.	Montane Wet Temperate	9
12.	Himalayan Moist Temperate	29
13.	Himalayan Dry Temperate	10
14.	Sub-Alpine	7
15.	Moist Alpine Scrub	8
16.	Dry Alpine Scrub	1
17.	Wetland	24

It can be seen from the above that by far the most common forest group in India's national parks and sanctuaries is Tropical Dry Deciduous, which also happens to be the most common kind of forest found in India. Tropical Moist Deciduous Forests also have a strong representation in our protected areas.

On the other hand, forest groups rarely represented are the Dry Alpine Scrub, reported only from the Valley of Flowers National Park (UP), the Tropical Dry Evergreen from Guindy National Park (TN) and Point Calimere Sanctuary (TN), and the Subtropical Dry Evergreen, reported from only Overa and Ramnagar Sanctuaries (both J&K).

#### *Limitations of the Data*

Since many of our national parks and sanctuaries have not been adequately surveyed on the ground, it is possible that the above data is incomplete. Also, it appears that in some cases the forest type reported was that of the general region within which the park or sanctuary was located and not necessarily of the park or sanctuary itself. Considering the most convenient listing of forest

types in an area is usually found in the forest working plans, which pertain to areas mostly larger than and including the parks or sanctuaries, this is understandable.

Besides, the actual present state of these forests is not at all clear, and it is quite possible that some of this information represents areas where these forest types did exist in the past but now either no forest exists or extensive felling of certain species of trees, or the introduction of exotic tree species, or both, has changed the nature of the forests.

The extent of area under different forest types in each park and sanctuary was asked for, but the replies were scanty. The information obtained is thus not reproduced here. It has also, therefore, not been possible to work out the extent of each forest type protected in parks and sanctuaries.

#### II:1.4a Species of Fauna (No table)

The protection of animal species has traditionally been considered an important part of the management of national parks and sanctuaries. Within this broad objective, preference is often given to those areas with an exceptionally diverse mix of species, or with populations of species which are endemic (like the Narcondam hornbill, *Rhyticeros plicatus*, found on the Narcondam Island Sanctuary in the Andamans), and/or greatly endangered (like the Asiatic lion, *Panthera leo*, at Gir National Park).

A question was thus asked on the fauna found in each national park and sanctuary. A total of 38 national parks and 175 sanctuaries responded with a list of some of the mammals, reptiles and birds found within their boundaries. A total of 94 species of mammals and 20 species of reptiles and amphibians were reported. Most of these are listed in Schedule I or II of the Wild Life (Protection) Act 1972 (i.e., schedules as revised in 1979; see Annexure 3). While some areas sent fairly lengthy checklists of birds, listing over 200 species in a few cases, these have not been consolidated here. Of the birds present in Schedule I or II of the Act, 37 species were reported from the parks and sanctuaries responding. Very little information regarding fishes and insects was available with the park or sanctuary authorities.

Of the 65 species of mammals listed in Schedule I of the Act (see Annexure 3) only two, the Hispid hare (*Caprolagus hispidus*) and the Hog badger (*Arctonyx collaris*), found no mention in any park or sanctuary. The Hog badger is found in Arunachal Pradesh, from where none of the parks or sanctuaries reported its occurrence. As for the Hispid hare, its omission is perhaps due to the lack of response from Assam.

Of the 19 reptiles and amphibians mentioned in Schedule I of the Act (see Annexure 3), only one, the Indian egg eating snake (*Elachistodon westermanni*) was not reported from any park or sanctuary.

Of the 47 species of birds listed in Schedule I of the Act (see Annexure 3), the following 12 were not reported in any park or sanctuary: Hooded crane (*Grus monacha*), Whitethroated brown hornbill (*Ptilolaemus tickelli austeni*), Rufousnecked hornbill (*Aceros nipalensis*), Wreathed hornbill (*Rhyticeros*

*undulatus*), Redheaded merlin (*Falco chicquera*), Blyth's tragopan (*Tragopan blythii*), Satyr tragopan (*Tragopan satyra*), Temminck's tragopan (*Tragopan temminckii*), Western tragopan (*Capagopan melanocephalus*), Mrs. Hume's barredback pheasant (*Syrmaticus humiae*), Eared pheasant (*Crossoptilon crossoptilon*), and White-winged wood duck (*Cairina scutulata*). Some areas reported 'hornbills' and 'tragopans', but did not specify the exact species found.

Of the 213 parks and sanctuaries sending in lists of fauna, 69 (32%) reported conducting censuses or head-counts. In the remaining areas the main sources of information were:

- visual identification in 41 (19%)
- personal estimate of the Park Director in 32 (15%)
- pugmarks in 58 (27%)

#### *Limitations of the Data*

The fact that some Schedule I species have not been reported from any park or sanctuary obviously does not imply that these species are now extinct. This is not only because their existence may simply not have been recorded from a park or sanctuary, but also because they may be found outside parks and sanctuaries. (On the other hand, two birds thought to be extinct: the Pinkheaded duck (*Rhodonessa caryophyllacea*) and the Mountain quail (*Ophrysia superciliosa*), were reported to be thriving in Karnataka, which was never within their range of occurrence.)

Very few of the parks and sanctuaries provided data on the estimated population of the species reported. In many of the cases where population estimates were sent, it was not clear on what basis these estimates were made. The data regarding estimated population have, therefore, been omitted.

#### **II:1.4b Floral Species (No table)**

The focus on the role of parks and sanctuaries in the protection of plant species has been of fairly recent origin. Apart from the information on forest types (section II:1.3), very little information was forthcoming on species of plants, including threatened species.

Efforts to elicit information on specific plant species were also frustrated because of errors in the questionnaire. No information on floral species is, therefore, given here.

#### **II:1.5 Threatened Species of Fauna (No table)**

A vital function of national parks and sanctuaries is to preserve the habitat of several threatened or endangered species of fauna. Most of India's parks and sanctuaries contain one or more such species. While these species are endangered countrywide, they may, at the local level, be fairly abundant or common; on the other hand, they may be generally common but locally threatened. The distinction between 'locally' and 'nationally' threatened is thus important to keep in mind.

The data obtained on the presence of threatened species in each park or sanctuary did not, due to ambiguity in the questionnaire, distinguish between 'locally' and 'nationally' threatened. Several species were reported which are in Schedule I of the Act (revised list); it was difficult to tell if these species were locally threatened also, or locally abundant. Therefore, species not in Schedule I, but mentioned as being 'threatened' by park or sanctuary authorities, were presumed to be those which are locally threatened. (For species mentioned in Schedule I and therefore assumed to be nationally threatened, please see Annexure 3).

The list of these 'locally' threatened species is given below along with the name of the park or sanctuary from where they are reported:

Bear, Himalayan Black	Rakchham Chitkul and Tundah Sanctuaries (both HP), Senchal Sanctuary (WB)
Bear, Himalayan Brown	Daranghati, Lippa Asrang, Rakchham Chitkul, and Tundah Sanctuaries (all HP)
Cobra, King	Dandeli Sanctuary (KAR)
Coral spp.?	Marine National Park (GUJ)
Crab, Giant Robber	South Sentinal Island Sanctuary (A&N)
Crab, Horse-shoe	Sunderbans National Park (WB)
Deer, Barking	Darlaghat and Lippa Asrang Sanctuaries (both HP), Bethuadahari Sanctuary (WB)
Deer, Hog	Rajaji Sanctuary (now a national park—UP)
Deer, Spotted	Nandur Madhmeshwar Sanctuary (MAH), Satpura National Park (MP), Barnawapara Sanctuary (MP), Chandka Dampara and Simlipal Sanctuaries (both ORI), Jaisamand and Sita Mata Sanctuaries (both RAJ) Anamalai Sanctuary (TN), Bethuadahari Sanctuary (WB)
Dog, Wild	Ghatigaon Sanctuary (MP)
Dolphin, Gangetic	National Chambal Sanctuary (MP)
Dolphin, Gangetic/Common ?	Sunderbans National Park (WB), Sajnakhal Sanctuary (WB)
Gaur or Indian Bison	Nongkhyllam and Siju Sanctuaries (both MEG), Sanjay and Bandhavgarh National Parks (both MP), Udanti Sanctuary (MP), Simlipal Sanctuary (ORI)
Goral	Lippa Asrang Sanctuary (HP), Senchal Sanctuary (WB)
Hyena	Tadoba National Park (MAH)
Marten, Nilgiri	Nilgiri Tahr Sanctuary (TN)
Myna, Hill	Siju Sanctuary (MEG), Hadgarh Sanctuary (ORI)
Nilgai (Bluebull)	Mudumalai Sanctuary (TN)
Otter, Clawless	Mudumalai Sanctuary (TN)
Oyster, Pearl ?	Marine National Park (GUJ)
Panda, Red	Siju Sanctuary (MEG), Fambung Lho Sanctuary (SIK)
Pig, Indian Wild	Barnawapara Sanctuary (MP), Chandka Dampara Sanctuary (ORI)
Porcupine, Indian	Tadoba National Park (MAH)
Sambar	Udanti Sanctuary (MP), Kumbhalgarh, Mount Abu, and Sita Mata Sanctuaries (all RAJ), Bethuadahari Sanctuary (WB)
Terrapin, Batagur (River)	Sunderbans National Park (WB)
Woodpecker, Black	Mudumalai Sanctuary (TN)
? Species unspecified	

*Limitations of the Data*

As already mentioned, the data obtained do not distinguish between 'locally' and 'nationally' threatened. It is thus possible that several species which were mentioned in the response but which were left out from the above list due to their being on Schedule I, may actually also be locally threatened.

It should also be noted that those listed above as 'locally' threatened may also be 'nationally' threatened—their exclusion from Schedule I does not necessarily imply a non-threatened status. The King cobra is perhaps an example of this.

**II:1.6 Forest Corridors**

The existence of corridors connecting various parks and sanctuaries is considered important for the well-being of wildlife, especially of the larger mammals. Such corridors allow movement of animals between different protected areas, enlarge their range and the habitat available to them, and facilitate the maintenance of genetic diversity and health by allowing different populations to intermingle. This significantly increases their chances of survival. Ideally, all the protected areas should be so interlinked so that the problems attendant to the restrictions of habitat are minimised.

Of the 46 national parks and 199 sanctuaries responding (extended data base), 14 (30%) of the parks and 52 (26%) of the sanctuaries reported being connected to another sanctuary or park in this manner. These are listed in the table, along with names of the park/sanctuary they are connected to.

It is worth noting that none of the responding parks and sanctuaries in the following states are connected by corridors: Goa, Gujarat, Haryana, Manipur, Meghalaya, Sikkim and West Bengal.

*Limitations of the Data*

The data presented do not give any idea of the quality and protection status of the forest corridors. Also, this information may be under-reporting the presence of corridors like aquatic or marine stretches, or natural ecosystem corridors other than forests.

**II:1.7 Water Resources (No table)**

The availability of water is obviously important in the maintenance and regeneration of wildlife habitat, and for the well-being of the plant and animal population within a park or sanctuary.

In general, the water availability in an area is one factor in determining the type and quantum of vegetation and animal life that can exist there. In India, there are national parks and sanctuaries covering desert regions with less than 200 mm annual rainfall, while there are some in tropical rainforest areas with over 4000 mm annual precipitation. Most parks and sanctuaries have lakes, rivers and streams, offering not only water to terrestrial animals but also a home to diverse aquatic fauna.

The information on water resources, as collected through the questionnaire, was too scanty to be useful at an aggregated national or state level. It is, therefore, not being included here.

Data on droughts and on waterlogging given elsewhere in this report (sections II:2.3 and II:2.6) give some information on water-related factors.

## II:2 FACTORS AFFECTING HABITAT

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National parks and sanctuaries are affected by a number of physical factors, usually termed 'natural' phenomena, though in many cases they may actually be a result of human intervention. These factors include forest fires, floods, droughts, water pollution, epidemics of flora and fauna, waterlogging, and climatic phenomena such as hot winds, gales, cyclones, frost and hailstorms. Data obtained on these are presented below.

There is a temptation to call these factors 'abnormal' or 'problematic', as if they are *prima facie* a threat to the ecosystem or to particular plant or animal species. But this is not always the case. Indeed, fires, floods and other such phenomena are often natural to the local ecosystem. However, sometimes these factors are caused or exacerbated by human intervention. This is true not only for water pollution, but also for floods (caused or increased by deforestation in upstream catchment areas), or forest fires (caused by carelessness or deliberate burning for various purposes).

It should thus be emphasised that both the causes and the ecological impacts of these factors are difficult to establish with the data obtained.

### II:2.1 Forest Fires

Fires often occur as a natural phenomenon, a part of the dynamics of forest regeneration and succession. Using fire as a deliberate management strategy is also not uncommon in wildlife protected areas, the idea being to allow the growth of new shoots which are favoured by wild herbivores.

However, in India a large number of accidental, human-caused fires are reported from forest areas. These are often a result of carelessness, a cigarette or 'bidi' thrown unthinkingly, a small deliberate fire spreading over a much larger area than desired, and so on. Such fires are a threat to the ecosystem. Their prevention and control has thus become an important part of the management strategies in national parks and sanctuaries.

Information was sought on the occurrence and extent of forest fires in each national park and sanctuary, and on the measures being taken, if any, to counter these fires. Data on occurrence are presented below, while data on fire-fighting measures is given separately (see section IV:2.21).

Of the 37 national parks and 165 sanctuaries sending in information on this aspect, 20 national parks (54%) and 65 sanctuaries (39%) reported the occurrence of forest fires. National parks which reported fires registered an average of 34 fires per park during a five-year period (an average of nearly 7 fires per park per annum).

In Gujarat, Gir National Park reported 212 fires during the period 1979-80 to 1983-84. In Karnataka, Bannerghatta National Park for the same period reported 103 fires. In Maharashtra, Sanjay National Park reported 162 fires.

Sanctuaries registered an average of 12 fires for a five-year period (a little over 2 per annum). Here also, there was quite a range between different areas. In Maharashtra, Kinwat Sanctuary with 43 cases of fire from 1979 to 1984, Tansa Sanctuary with 82, and Yawal Sanctuary with 74, were on the high side. In MP, Pachmarhi Sanctuary in three years, 1981-82 to 1983-84, reported 32. In Tamil Nadu, Anamalai Sanctuary with 53 in 4 years, Kalakad Sanctuary with 75 in five years, and Mundanthurai Sanctuary with 64, also in five years, showed the highest incidence.

#### *Limitations of the Data*

Considering the vast variation between different parks, perhaps the national and state averages might not be reliable indicators of the occurrence area wise.

The level of detection and recording of fires is not uniform for all the parks and sanctuaries. The information, as such, is not comparable. Information sought on forest fires in another question has yielded somewhat different figures (See section II:2.5). At best, this information can be taken as reflecting the minimum incidence for it would be rare for an area to report a fire when there has been none. The converse, unfortunately, need not be true.

As already mentioned, these fires might have varying impact on the habitat, and without detailed study no conclusions can be drawn about the 'threat' they pose, if any. Neither can one deduce, from the number of fires that occurred, any facts about the management of the area. There is, for instance, no necessary correlation between a higher number of fires reported and poor management. The relative size of the area, the cause of the fire, the staff's response to the fire and the fire-proneness of the different parks and sanctuaries have to be studied, and only then can a comparative picture emerge in terms of the management of the area. Obviously some areas, like wetlands or evergreen rain forests, are far less susceptible than others.

#### II:2.2 Floods

*A very small number of the parks and sanctuaries responding reported incidence of floods: 2 (5%) of the 42 parks and 14 (8%) of the 168 sanctuaries. Of the 82 incidents of floods reported from sanctuaries for the five-year period, 40 (49%) were from Madhya Pradesh, and of these 35 from a single sanctuary: Nauradehi. Dandeli Sanctuary in Karnataka reported 11 incidents.*

#### *Limitations of the Data*

As many of the areas are not susceptible to floods, these figures would, of course, be more meaningful if they were looked at in relation to the number of parks and sanctuaries which have a potential threat of floods. Unfortunately, the available data do not allow such a comparison at present.

### II:2.3 Droughts

Though availability of water is a crucial factor for wildlife and habitat management, the data available for this and for droughts are very scanty. Perhaps the level of monitoring needed to properly evaluate the adequacy of water resources is not yet possible in most of the parks and sanctuaries. This is especially unfortunate as droughts not only directly affect the wildlife within a park or sanctuary, but also often increase the pressures on the resources of these areas as livestock from surrounding areas enter in search of water.

*Of the 39 national parks and 153 sanctuaries responding only 4 (10%) and 28 (18%) respectively reported incidence of drought.*

#### *Limitations of the Data*

As already mentioned, data regarding the existence of water resources could not be usefully interpreted as the returns were scanty. In addition, the term 'drought' would not have been interpreted uniformly across the country, thus clubbing together brief as well as prolonged dry periods. This was a defect in the questionnaire itself, since 'drought' and many other such terms in other questions were not given precise definitions.

### II:2.4 Water Pollution

The increasing pollution of rivers and waterways poses a threat not only to human health but also to the well-being of other animals and of plants. 6 (15%) of the 41 national parks and 20 (11%) of the 174 sanctuaries responding reported pollution of their water sources. These are listed in the table, with details on the source and type of pollution, its impact, and the action being taken, if any.

The major sources of pollution reported were industries and urban sewers, the former emitting industrial effluents and the latter municipal waste. In a few cases, cattle and soil erosion from fields were also cited as sources of pollution.

Among the worst polluted of the national parks responding seemed to be the Marine National Park in Gujarat, which reported multiple sources of pollution: salt works, oil terminal and steamers.

Among sanctuaries, Gobind Sagar in Himachal Pradesh was the recipient of pollutants from a cement factory, limestone quarry, match factory and from municipal sewers. Similarly, National Chambal Sanctuary in Rajasthan reported the Kota Thermal Plant, Sriram Chemicals factory, and Rajasthan Atomic Power Station as sources of pollution. Interestingly, 'possible radiation' from the Rajasthan Atomic Power Station was also cited as a pollutant in Jawahar Sagar Sanctuary of Rajasthan.

#### *Limitations of the Data*

Only those national parks and sanctuaries seem to have reported incidence of pollution where the sources of pollution are visible or obvious.

Considering the level of monitoring in parks and sanctuaries (not a single one has indicated any monitoring of water quality) and considering that there

is no evidence to believe that any other agency monitors the water quality in most of these areas, it seems inevitable that much of the water pollution in parks and sanctuaries, especially due to the widespread use of pesticides and chemical fertilizers, goes undetected.

#### II:2.5 Hot Winds, Gales and Cyclones, Frost, Hail Storms and Forest Fires

*Of the 43 national parks and 184 sanctuaries responding, 39 (91%) and 151 (82%) respectively reported occurrence of one or more of these phenomena.*

Among responding national parks, 11 (26%) reported hot winds, 8 (19%) reported gales and cyclones, 13 (30%) reported frost, 12 (30%) reported hail storms, and 23 (54%) reported occurrence of forest fires. Of the sanctuaries responding, 77 (42%) reported hot winds, 32 (17%) reported gales and cyclones, 45 (25%) reported frost, and 55 (30%) reported hail storms. In response to this question 89 (48%) of the sanctuaries responding reported forest fires, compared to 65(39%) in Section II:2:1.

##### *Limitations of the Data*

In very few of the parks and sanctuaries is there an observatory to record these natural phenomena. In most cases the information provided seems to be based on casual observation and on varying definitions, and perhaps refers to the nearest observatory, rather than to the park or sanctuary itself. It would, therefore, be improper to base too much on this data. At best, it only indicates a very imprecise range of occurrence.

#### II:2.6 Water-logging and Other Factors

Physical factors affecting the habitat, such as water-logging, fire, floods, etc., have implications on the management of a park or sanctuary. While these factors are usually termed 'natural', they may in fact at times be caused, or aggravated, by human activities.

Details of some of these factors have been given earlier in this report (sections II:2.1 to II:2.5). In this question details of water-logging and other abnormal factors not asked for elsewhere were obtained. However, in the category of 'other factors' the responses received included factors dealt with in other questions like those on fire and droughts; hence there is some overlap in the information provided.

*Only 1 (2%) of the 43 national parks and 3 (2%) of the 171 sanctuaries responding reported the presence of water-logging. These are the Tadoba National Park in Maharashtra, Dhrangadhra Sanctuary in Gujarat, Valmiki Nagar Sanctuary in Bihar, and Ballavpur Sanctuary in West Bengal. 'Other' factors were reported from 10 (23%) of the 43 national parks and 40 (23%) of the 171 sanctuaries responding.*

Of the 17 'other' kinds of abnormal factors reported from various parks and sanctuaries, 7 have been reported in detail elsewhere—these are fires, floods, droughts, cyclones, winds, frost and water pollution. Of the remaining, the most common are landslides, reported from 6 national parks and sanctuaries.

### *Limitations of the Data*

The figures given here may not give a completely accurate picture because many of these factors are hard to define and distinguish clearly, as is the case with water-logging. An area where the water table rises to just below the land surface could in certain conditions be said to be water-logged, but since this is not readily visible, wildlife personnel with no equipment for, or training in, such matters would be hard put to recognize it. In any case, the level of monitoring and research work in most parks and sanctuaries is so little that many of these factors may not be noticed at all. On the other hand, very temporary instances of land becoming marshy may be taken as a sign of water-logging though it may not be so. A similar vagueness exists with many other terms too, such as siltation, in the absence of any standard definition being in use or provided in the questionnaire.

The data on the presence of such factors does not show the kinds of impact they have. It is difficult to state *prima facie* that these factors are all actually problematic, i.e., that they have adverse effects on the ecosystem, flora and fauna. Establishing such an impact would require studies of the sort which do not seem to have been carried out so far in most of our parks and sanctuaries.

As mentioned earlier, the data given here on fires, floods, droughts, winds, cyclones, frost and water pollution overlap with more detailed data on these phenomena given elsewhere, in separate tables for each. In some cases information regarding the same phenomenon given in response to two different questions does not match.

### II:2.7 & 2.8 Flora and Fauna Epidemics (No table)

Serious management issues arise when plant or animal species in a national park or sanctuary are affected by an epidemic. The resultant loss in numbers, and the consequences of this on the food web and the ecosystem of which these species are a part, are matters of grave concern to those managing a wildlife habitat. Details of recorded epidemics of flora and fauna were solicited to judge the extent to which our protected areas suffer from such problems.

*Fauna epidemics were reported from 8 (19%) of the 43 national parks and 9 (5%) of the 176 sanctuaries responding.* The two most common diseases reported were foot and mouth disease, and rinderpest. The species commonly affected were Spotted deer, Nilgai, Goral, Sambar and Gaur —others affected in one or two cases were the Himalayan tahr, Black buck, Jackal and Wild boar. Of the 17 parks and sanctuaries reporting epidemics, 10 reported having taken some form of preventive measures. These usually consisted of vaccinating the cattle (the main transmitter of these diseases), and treating the wild animals' water sources.

*Epidemics of flora were reported from only 1 (2%) of the 41 national parks and 11 (6%) of the 174 sanctuaries responding.* The most common problems mentioned were defoliation and skeletonisation, and in all but two of the instances the species affected was teak (*Tectona grandis*). Preventive measures

have reportedly not been undertaken in any of the parks or sanctuaries reporting plant epidemics.

*Limitations of the Data*

The responses to these questions were very scanty. It appears that the kind of monitoring necessary to keep accurate records of plant and animal epidemics is presently not possible. In most cases the response received was 'no such report' (of epidemics) or 'no study done' — very rarely was the response a definite 'no incidence of epidemic'. It is notable that the diseases reported are almost always the same, which seems to indicate that information regarding diseases other than the most common and obvious ones may be lacking. For these reasons data received can only be seen to reflect a bare minimum of the actual incidence of epidemics.

### III. Human Activities

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The interaction between human populations and wilderness areas is fundamental to human civilization. In fact, human beings are as much a part of nature as any of the other animals or plants. Human activities in and around national parks and sanctuaries cannot, therefore, be *prima facie* considered undesirable. What is undesirable is the pushing of the ecosystem to beyond its carrying capacity by excessive destruction of fauna and flora. This is unfortunately becoming increasingly common due either to new types of human activities or to an increase in population leading to even the traditional activities becoming destructive.

Obviously it is neither desirable nor possible to alienate the people living in and around the protected areas, most of whom are poor, from the natural resources around them. However, if they and the rest of humanity have to have a continued and sustainable interaction with nature, it has to be ensured that these areas are not progressively degraded.

In order to work towards an understanding of these aspects, information was collected on various human activities and uses, and is presented in this chapter. It must be mentioned here that it is not possible, with the data available, to judge the nature and extent of ecological impact of the various human use activities described below—hence this must remain a major limitation of the data presented. The responses from park and sanctuary officials make it evident that very little is yet known on the ecological impact of human activities in parks and sanctuaries.

This chapter is divided into three sections: rights, leases and other legal uses; illegal activities and uses; and conflicts.

#### III:1 RIGHTS, LEASES AND OTHER LEGAL USES

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This section contains details regarding human settlements within and around parks and sanctuaries; the rights and leases existing within parks and sanctuaries; activities in these areas by government departments or agencies other than the wildlife wing; use of parks and sanctuaries for extraction of timber and minor forest produce, for grazing and fodder extraction, for plantation of trees and for tourism.

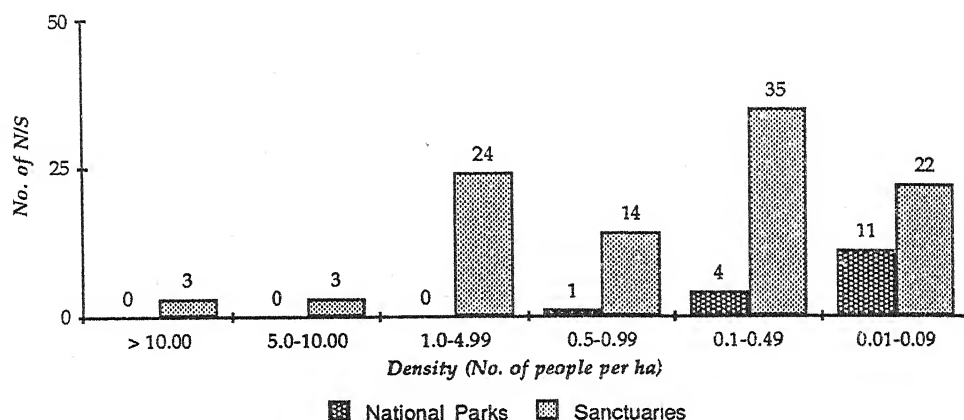
##### III:1.1 Human Population

Information was obtained separately for human populations residing inside each park or sanctuary and those living in areas adjacent to it (i.e. within a 10-km radius of the park boundary).

**Population within Parks and Sanctuaries:** Of the 32 national parks and 138 sanctuaries responding, 18 (56%) and 100 (72%) respectively reported human populations within their boundaries. Since the absolute quantum of population inside is not a good indicator of the potential biotic pressure it can put on to the ecosystem, the extended data base was used to work out population densities. This has been worked out by a simple division of the total population with the total area of each park and sanctuary. The resultant list is reproduced in Table III:1.1a, with areas arranged in descending order down to a density of 0.01.

The data obtained reveals the following ranges of density:

#### HUMAN POPULATION: WITHIN



Considering that the average density in India as a whole is a little over 2.5 per hectare, 10 protected areas (all sanctuaries) have a population density higher than the national figure. The national park with the highest density is Bansda in Gujarat, harbouring 0.56 persons per hectare.

Tables III:1.1b and III:1.1c give the density of population separately for core and buffer zones, in the case of those national parks and sanctuaries which have reported such zoning and provided separate figures. Pench National Park (MAH) reported the highest density within the core zone among national parks, with 0.39 people per hectare.

In the case of buffer zones, Bor Sanctuary (MAH) reported the presence of over 46 persons per hectare, by far the greatest density among sanctuaries.

**Population Adjacent to Parks and Sanctuaries:** Human populations adjacent to a national park or sanctuary could be a source of pressure on the protected area. This is especially true of many parts of India where these protected areas are

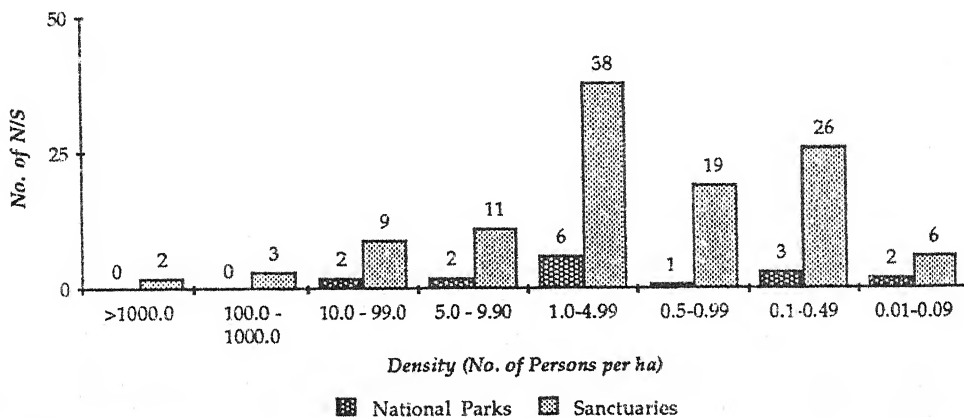
the only remaining source of fuel, fodder, and other forest produce, with most surrounding areas having been degraded.

Adjacent human settlements can also affect the potential of wild animals to migrate to nearby habitats. Where traditional migrating routes are thus cut off, as has happened in many parts of the country, it is a loss not only to the wild animals, but also to the humans in the form of crop and livestock damage and the injuring or killing of people by animals trying to migrate. The case of elephants is especially illustrative of this.

It was, thus, thought important to obtain information on the existence and extent of populations living adjacent to parks and sanctuaries, i.e. within a 10 km. radius of the boundary. Of the 23 national parks and 132 sanctuaries responding, 19 (83%) and 115 (87%) respectively, reported populations in their adjacent areas. These high percentages are only to be expected in a country like India where the only areas left uninhabited are the most inaccessible ones.

An index of population pressures was worked out for each protected area by dividing the total population reported from adjacent areas with the total area of the park or sanctuary, both sets of data obtained from the extended data base. (Note that the index thus worked out is in relation to the area of each park and sanctuary, and not in relation to the area adjacent). The results are presented in Table III:1.1d. The ranges of index of population pressures on national parks and sanctuaries is presented below:

#### ADJACENT POPULATION PRESSURE INDEX



Ramnabagan Sanctuary (WB) reported an incredibly high adjacent population density of over 26675 persons for every hectare of the sanctuary. This could be because the town of Burdwan touches it. Karnala Sanctuary (MAH) is also on the high side, with a population of over 2232 persons per hectare of the sanctuary. For national parks, Van Vihar (MP) with over 67 persons per hectare is the one with the greatest adjacent population density. This is obviously because of the proximity of the city of Bhopal.

### Limitations of the Data

While average density of population gives a rough idea of the comparative pressures that each park and sanctuary is subject to, the analysis needs to be made much more sophisticated by taking into account various complicating factors, such as the spatial distribution of the population within the area, the socio-economic characteristics of the communities, and so on. This has not been possible here. It follows that little can be said from these data about the likely ecological impact of the human populations living within or around each protected area. The data do however give some idea of the pressures faced by park managers from human populations in and around the areas managed by them.

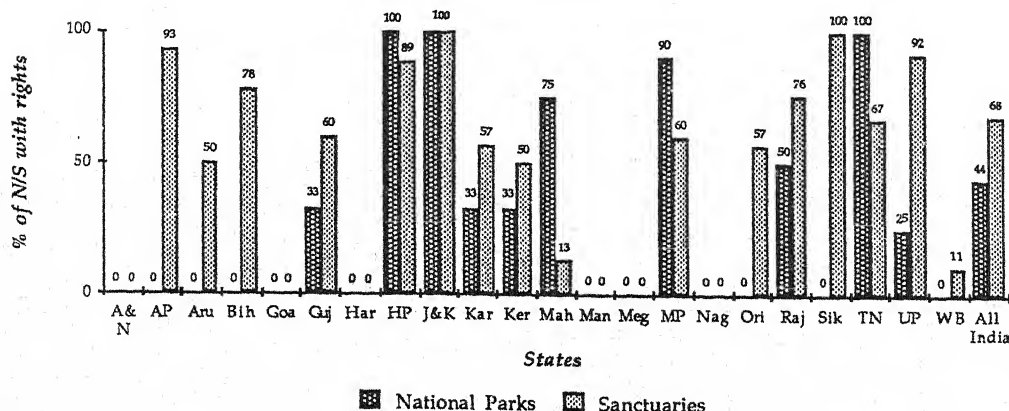
### III:1.2 Rights and Leases

In 19 (43%) of the 44 national parks and 128 (68%) of the 187 sanctuaries responding there exist some rights or leases. In national parks the most common types of rights and leases pertain to grazing, which was present in 60% of the 20 parks with rights and leases, habitation in 50%, religious yatra in 45% and agriculture in 45%. Similarly, in sanctuaries grazing is by far the most common right, present in 84% of the 128 with rights. The other common ones are fuelwood collection in 54%, collection of minor forest produce in 47%, agriculture in 43%, and habitation in 42% of the sanctuaries with rights.

Of the 16 different types of rights or leases reported, the Great Himalayan National Park in Himachal Pradesh reported the existence of 9 types, and the Sariska National Park in Rajasthan of 8.

Among sanctuaries, Chail, Rupri Bhaba and Shilli in Himachal Pradesh reported the existence of 10 types of rights or leases each. Pakhal (AP), Shimla (HP), and Kumbhalgarh (RAJ) reported 9. Darlaghat (HP), Kanawar (HP), Majathal (HP), Manali (HP), Nargu (HP), Tirthan (HP), Tundah (HP), Pachmarhi (MP), and Pamed (MP), reported 8 types of rights and leases each.

RIGHTS & LEASES WITHIN N/S



### Limitations of the Data

Considering that only for 8% of the sanctuaries and 40% of the national parks have the legal procedures been completed (see Table I:1.1), it is probable that in many of the areas the rights and leases existing have not yet been recorded by the wildlife authorities. It is, therefore, possible that many more areas might actually have rights and leases, and many of the areas might have more rights and leases than reported. These figures can, thus, be taken to represent only a minimum.

### III: 1.3 Grazing by Livestock

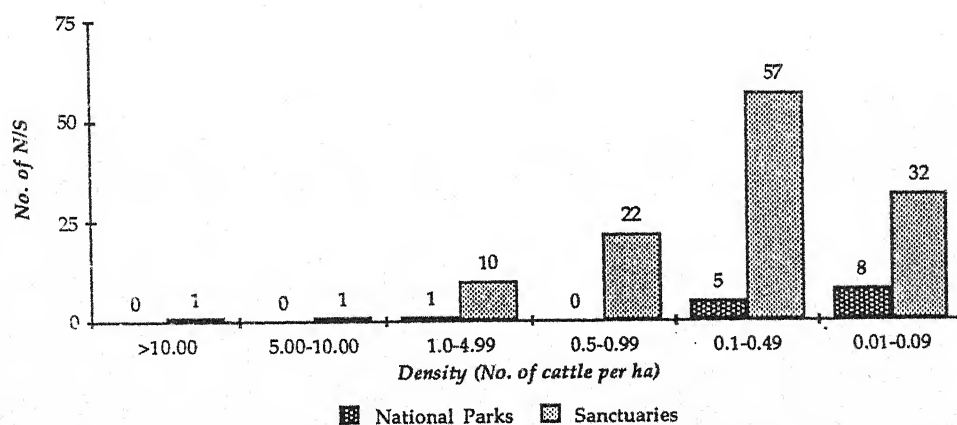
Of the 36 national parks and 138 sanctuaries responding, 14 (39%) and 101 (73%) respectively, allow grazing of livestock within their boundaries.

Of the 14 national parks allowing grazing, six have been legally constituted as national parks with their final notifications having been issued. These six are : Bansda and Gir in Gujarat, Dachigam in J&K, Ranthambore in Rajasthan, Khangchendzonga in Sikkim (which reported 70 authorised yaks), and Dudhwa in U.P.

Of the 36 national parks and 138 sanctuaries responding, 24 (67%) and 114 (83%) respectively report incidence of grazing. In other words, grazing is occurring, though it is not authorised, in 10 of the national parks responding (42% of those which have grazing) and in 13 (11% of those with grazing) of the sanctuaries.

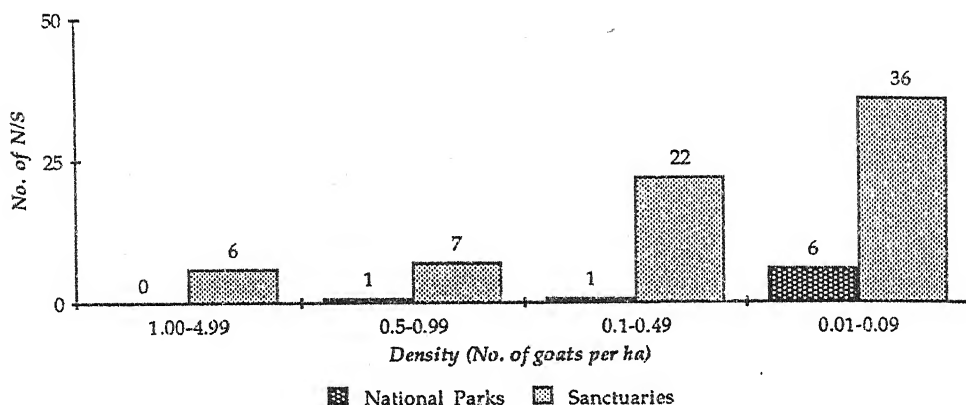
Since different kinds of livestock have different ecological impacts, the overall livestock figures have been broken up into separate figures for cattle, sheep, goats, and feral cattle, and their densities worked out (number of livestock divided by area in ha. of park/sanctuary). The extended data base was used to obtain these figures. Tables III:1.3a to III:1.3d present densities of cattle, feral cattle, goats, and sheep for each park and sanctuary, arranged in descending order. The range of densities obtained is as shown below:

#### CATTLE



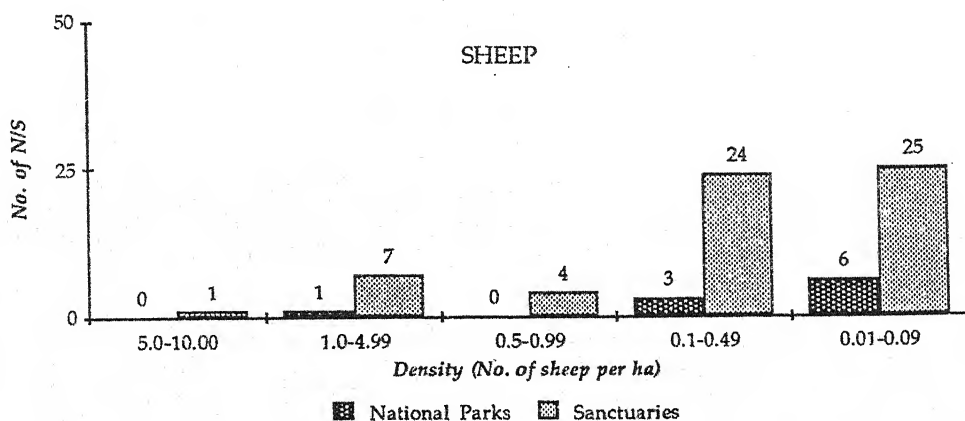
Note that the national density is roughly 0.75 cattle per ha., if one takes the 1977 figure of 240 million heads of cattle and buffaloes (Centre for Science and Environment, 1985). Relative to this, an extremely high cattle density was reported from Sailana Sanctuary (MP), which has over 15 cattle grazing per ha. Of the national parks, Keibul Lamjao (MAN) reported a density of 2.5, which may be alarming considering this is the last home of the greatly endangered Brow-antlered deer, (*Cervus eldi*).

## GOATS



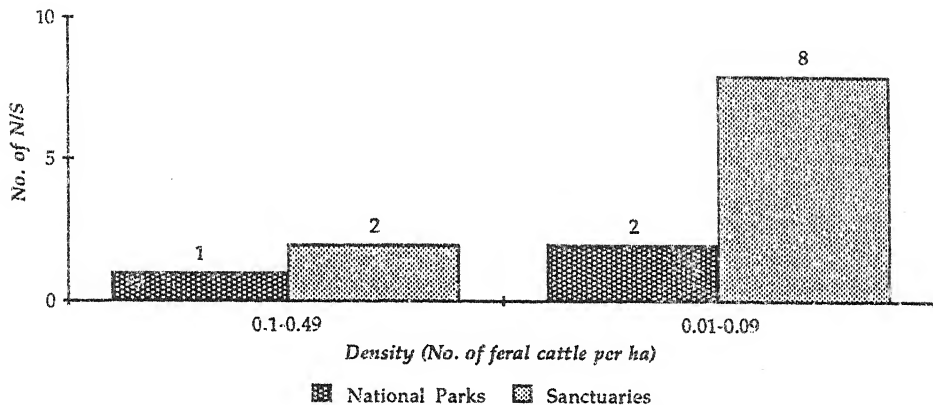
Density of goats for India as a whole is roughly 0.24 per ha., given the 1977 figure of 76 million goats in India (Centre for Science and Environment, 1985). Relative to this, Gangul Siahbehi Sanctuary (HP) and Sailana Sanctuary (MP) reported very high goat densities of 4.44 and 3.86 per ha, respectively. Of the national parks, Sariska (RAJ) reported grazing density of nearly 1 goat per hectare, over four times the national average.

## SHEEP



The density of sheep in India is roughly 0.13 per ha, if one takes the 1977 figure of 41 million sheep in the country (Centre for Science and Environment, 1985). As in the case of goats, Gangul Siahbehi Sanctuary (HP) reported the highest density of sheep from amongst sanctuaries, with 5.55 sheep per ha. Of the national parks, Pench (MAH) topped the list with 0.35 sheep per ha, almost three times the national density.

#### FERAL CATTLE



Evidently the incidence of feral cattle grazing within parks and sanctuaries is not as significant as grazing by cattle, goats, and sheep. Of the sanctuaries, Palpur Kund (MP) reported the highest density, with 0.25 feral cattle per ha. Bansda National Park (GUJ) with 0.14 feral cattle per ha topped the list of those national parks which reported grazing by feral cattle within their boundaries.

Information was also sought on whether fees are charged for grazing of livestock within any of the parks or sanctuaries. Data obtained show that fees are charged in 8 (57%) of the 14 national parks and in 35 (35%) of the 101 sanctuaries which allow grazing and have responded. Andhra Pradesh, Bihar, and Karnataka did not charge a grazing fee in any of the responding sanctuaries where grazing was permitted.

#### Limitations of the Data

As in the case of human populations, the data presented above can be better appreciated after more sophisticated analysis involving factors such as the distribution of the livestock within the area, the mix of livestock grazing at any given time, and so on. This has not been possible here.

**III:1.4 Extraction of Fodder (No table)**

Some parks and sanctuaries permit the extraction of fodder from their area. Most of these are parks and sanctuaries other than those which permit grazing, but there are a few which permit both grazing and extraction of fodder.

Information presented below is from the extended database. Of the 51 national parks and 204 sanctuaries responding, 7 (14%) and 63 (31%) respectively reported permitting extraction of fodder and from all these areas fodder was, in fact, being extracted. These parks and sanctuaries are:

AP/S/NAG	HP/S/MAJ	MAH/S/BHI	MP/S/SAI
BIH/S/GAU	HP/S/NAI	MAH/S/DHA	MP/S/SIT
BIH/S/LAW	HP/S/PON	MAH/S/GRE	ORI/S/SAT
BIH/S/PAL	HP/S/RAK	MAH/S/KAL	RAJ/S/BHE
BIH/S/RAJ	HP/S/RUP	MAH/S/MEL	RAJ/S/DAR
CHA/S/SUK	HP/S/SHIL	MAH/S/TAN	RAJ/S/JAI
GUJ/S/DHR	HP/S/SHIM	MP/N/KANG	RAJ/S/JAW
GUJ/S/DUM	HP/S/TAL	MP/N/MAD	RAJ/S/KAI
GUJ/S/NAR	HP/S/TUN	MP/N/PAN	RAJ/S/KUM
HAR/S/SUL	J&K/N/DAC	MP/S/BOR	RAJ/S/MOU
HP/S/CHA	J&K/N/HEM	MP/S/GAN	RAJ/S/NAT
HP/S/DARA	J&K/N/KIS	MP/S/KAR	RAJ/S/PHU
HP/S/DARL	J&K/S/NAN	MP/S/KHA	RAJ/S/SIT
HP/S/GAM	KAR/S/MOC	MP/S/KHE	RAJ/S/TOD
HP/S/GOB	KAR/S/SHA	MP/S/NAR	TN/N/GUI
HP/S/KAL	KAR/S/SHE	MP/S/PAC	UP/S/KED
HP/S/KUG	KAR/S/SOM	MP/S/PAL	UP/S/NAT
HP/S/LIP	MP/S/PHE		

**Limitations of the Data**

These figures only reflect incidence of authorised extraction of fodder. They do not reflect the unauthorised extraction of fodder that possibly exists in a large number of the parks and sanctuaries.

**III:1.5 Extraction of Timber and Minor Forest Products**

**Timber** Of the 44 national parks and 183 sanctuaries responding, 7 (16%) and 78 (43%) respectively reported extraction of timber.

**Minor Forest Produce** 14 (36%) of the 39 national parks and 104 (56%) of the 185 sanctuaries responding reported extraction of minor forest produce (MFP).

**Limitations of the Data**

First, these figures only cover national parks and sanctuaries where tree felling and extraction of minor forest produce are *officially allowed*. They do not reflect those areas where it goes on without official sanction. A comparison of these data with that of populations in and adjacent to parks and sanctuaries (Table III:1.1) shows that whereas 56% of the national parks have human populations living within them and 83% have populations in adjacent areas (10 kms. radius), only 37% have reported the extraction of minor forest produce. In the case of sanctuaries, of which 72% have human populations living within the boundaries, and 87% have human populations in adjacent areas, only 58%

have reported extraction of minor forest produce. It seems reasonable to assume that if there are human populations within or around a protected area, especially within it, they would make at least some use of the park or sanctuary for their fuel and minor forest produce needs.

### III:1.6 Crop Protection Guns

Crop protection guns are allowed to farmers for protecting their standing crops against wild animals. These guns are required to be surrendered once harvesting is over and are only re-issued during the next season. However, crop protection guns can also be a potential hazard to the wildlife within parks and sanctuaries as they can be used for illegal hunting.

*Of the 36 national parks and 179 sanctuaries responding, 24 (64%) and 127 (71%) respectively reported the existence of crop protection guns in villages inside or surrounding them.*

The extended data base was used to obtain information on the surrendering of these guns. Only 2 national parks and 8 sanctuaries reported the surrendering of the guns in the non-cropping season. These are: Pench National Park in Maharashtra, and Kanha National Park in Madhya Pradesh; Kawal and Nagarjunasagar Sanctuaries in Andhra Pradesh; Sharavathi Sanctuary in Karnataka; Dhakna Kolkaz, Kinwat, and Melghat Sanctuaries in Maharashtra; Ratapani Sanctuary in Madhya Pradesh; and Chilla Sanctuary in Uttar Pradesh (now amalgamated into the Rajaji National Park).

#### *Limitations of the Data*

It is, of course, not possible to determine from these data the extent to which crop protection guns are used for poaching, if at all.

### III:1.7a Use and Occupation by other Government Departments and Agencies

The Wild Life (Protection) Act 1972 (and the corresponding J&K Act) specifies that the control of national parks and sanctuaries must vest with the Chief Wildlife Warden of each state (section 33 for sanctuaries, and section 35 (6-8) for national parks; see Annexure 2). What this implies is that any activity by a government agency or department in a national park or sanctuary, has to be cleared by the Chief Wildlife Warden.

As far back as 1973 the then Prime Minister of India, Smt. Indira Gandhi, in a D.O. letter addressed to all Chief Ministers (NO. 694-PM/73 dated December 27, 1973) had suggested that :

National Parks and Sanctuaries will be managed by the Wildlife Service exclusively, and all staff and activity will be under their control.

If for commercial reasons, a State Government is unwilling to stop exploitation within a national park or sanctuary, it will be the duty of the Wildlife Service rather than the Forest Department to conduct and supervise timber felling etc. Such an arrangement will ensure that damage to wildlife is minimised.

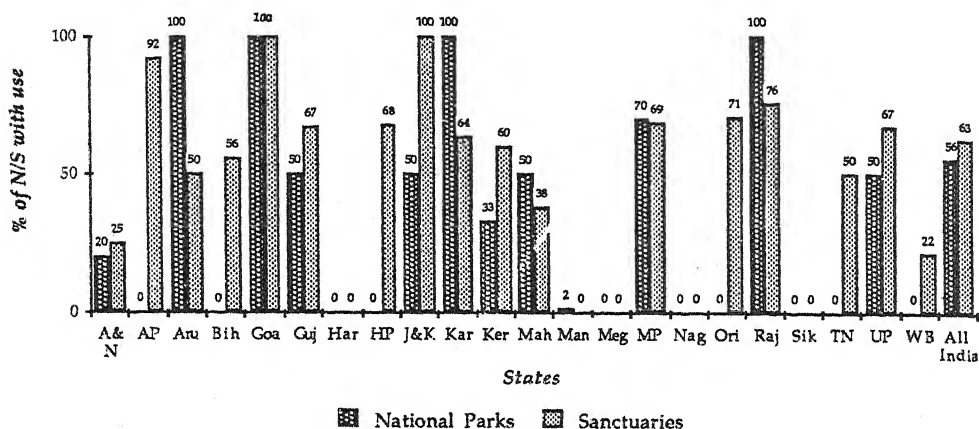
In a subsequent letter (dated September 16 1976) from the Joint Secretary (F & WL), Department of Agriculture, Government of India, it was clarified that:

All roads entering the sanctuaries and national parks should have check posts manned by 3 wild life forest guards working round the clock.

These views have since been reiterated through various other letters and circulars. Information on the kind and extent of use of parks and sanctuaries by government agencies and departments was thus sought.

Of the 45 national parks responding, 25 (56%) reported use or occupation by government departments and agencies other than the Wildlife Wing. Similarly, of the 188 sanctuaries responding, 119 (63%) have such use.

USE OF N/S AREA BY OTHER GOVERNMENT DEPARTMENTS



In national parks the most common use or occupation is that of roads controlled/used by other departments, which is present in 60% of the parks reporting any use. Other relatively common ones are tourism and transmission lines, present in 28%, and irrigation and housing in 20% of the parks responding.

In the case of sanctuaries, 55% of those having such uses reported the existence of roads, 36% reported transmission lines, and 31% reported irrigation under other government agencies. 20% also reported forestry activities being carried out by wings of the Forest Department other than the wildlife wing.

Of the 29 different uses reported by government departments and agencies other than the Wildlife Wing, the Periyar National Park in Kerala reported the existence of 7, the highest for a single national park. Similarly, among sanctuaries, Dandeli in Karnataka and Son Gharial in Madhya Pradesh reported 9 kinds of uses each, and Pakhal in Andhra Pradesh and Chail in Himachal Pradesh reported 7 each.

### III:1.7b Thoroughfare

Public thoroughfares in national parks or sanctuaries are potential sources of disturbance to these areas. They could also be seen as creating a situation where poaching, spread of disease by passing cattle, and problems created by increased quantum of visitors entering the park or sanctuary would become

difficult to control. A busy highway, apart from contributing to vehicular pollution, could also make it difficult to ensure that habitat is not destroyed or other unauthorised activities do not take place. *Of the 47 national parks and 204 sanctuaries responding, 22 (47%) and 117 (57%) respectively, reported the existence of a public thoroughfare.*

### III:1.8 Open to Tourists

Tourism, on the one hand, creates an interest in the preservation of parks, and is, in fact, often one of the rationales for the protection of natural areas. On the other hand, excessive or inappropriate tourist activities can constitute a major stress factor for ecosystems and a serious disturbance to wildlife.

To understand the potential of tourism in different areas and to judge the management issues posed by tourism in parks and sanctuaries, information was collected regarding the number of tourists visiting different areas and the number of areas officially open to tourists. *Of the 41 national parks and 168 sanctuaries, 37 (90%) and 140 (83%) respectively reported being officially open to tourists.*

The extended data base was used to obtain figures of the number of tourists visiting each national park and sanctuary in 1983-84. These figures, from 26 national parks and 75 sanctuaries, are listed in Table III:1.8a. The national park reporting by far the highest number of visitors, well over 15 lakh, was Sanjay National Park in Maharashtra. This is evidently because of its proximity to Bombay, from where a huge number of people come for day visits. Others which reported very high tourist figures are: Nandankanan Sanctuary (ORI) with 6.10 lakh, Bannerghatta National Park (KAR) with 2.40 lakh, Periyar National Park (KER) with 1.39 lakhs, and Nalsarovar Sanctuary (GUJ) with 1 lakh. It must be noted that of these, Nandankanan and Bannerghatta have within their boundaries zoos and/or safari parks, which attract a much larger number of visitors than purely wilderness areas.

#### *Limitations of the Data*

Many of the areas shown as being closed to tourists might actually be so remote that it is difficult for tourists to get there. Further, in some cases even though parks and sanctuaries are officially closed to tourists, as there is no boundary wall or fence around the area it is difficult to prevent people from entering it if they so desire. On the other hand, the fact that a park or sanctuary is open does not necessarily mean that it is visited, as it may be so remote, or so unknown to the public, that tourism may be absent or negligible.

Also, the fact that a national park or sanctuary is open to tourists does not mean that its entire area is open. In some parks and sanctuaries there are separate tourist zones, from which tourists are not allowed to stray, especially into the core zone.

Further, information regarding the number of tourists visiting each area may not be accurate for all areas, for a variety of reasons. A large number of the areas cannot completely control the entry of persons, for they do not have a

wall or fencing around their boundaries, with manned entry points. So the number of visitors may be underestimated. Many others do not even have a system of recording the number of visitors; the tourist numbers provided could therefore be rough estimates of the responding officials.

In most cases, the impact of tourism on the ecosystem of parks and sanctuaries cannot be calculated without a more detailed study of each of the areas. However, some of the areas report significant disruption due to the quantum or nature of tourism. An example of this is the Sultanpur Sanctuary in Haryana. However, even for this, only a detailed study would show the exact nature of impact.

### III:1.9 Plantations

Manipulation of the habitat of parks and sanctuaries can and is being done in various ways. One such is the plantation of trees within the boundaries. Data collected show that plantation work takes place in quite a few of the parks and sanctuaries. *Of the 39 national parks and 163 sanctuaries responding, 17(44%) and 94 (58%) respectively, reported that plantation work was undertaken between 1979 and 1984.*

In terms of purpose, in national parks 87% of the plantations were for wildlife habitat, 5% for fuel, 2% for commercial and industrial use, and 4% for other uses. However, for sanctuaries, the major purpose of plantations was cited as commercial (41%), followed by fuel (33%), wildlife habitat (16%) and other uses (7%). The national parks that reported commercial plantations are Pench (MAH), Kanger Ghati (MP), and Bhagwan Mahavir (GOA).

### III:1.10 Interstate Boundaries or Other Vulnerable Areas

The existence of inter-state boundaries or other vulnerable areas sometimes create special problems in the management of national parks and sanctuaries.

Interstate boundaries near the park or sanctuary prevent the wildlife staff from properly protecting the area as poachers and other persons involved in illegal activities can slip across the border. The officials of one state do not ordinarily have the authority to operate within another state, unless prior permission is taken. Such borders can also lead to problems of interstate cooperation in habitat management. These problems could be even greater in the case of international boundaries. *Of the 47 national parks and 202 sanctuaries responding, 11 (23%) and 48 (24%) respectively reported the existence of interstate boundaries and other vulnerable areas creating special problems.*

## III:2 ILLEGAL USE AND ACTIVITIES

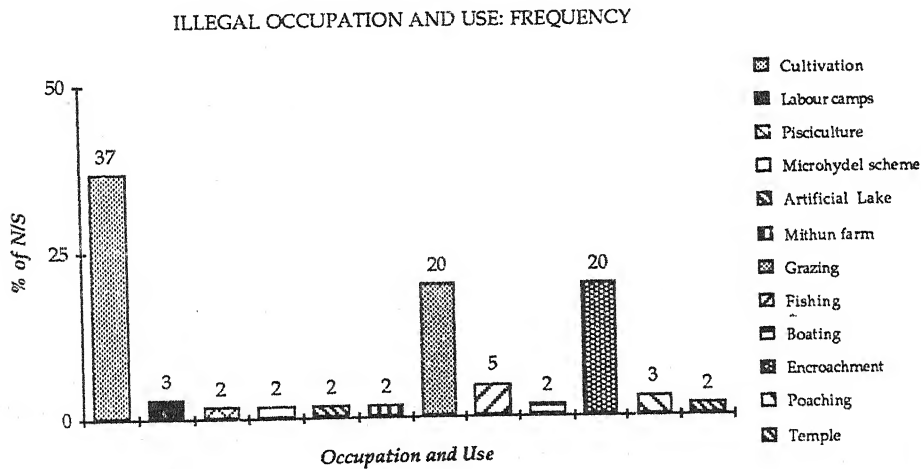
### III:2.1 Illegal Occupation and Use

The pressures generated by legal use of the natural resources inside national parks and sanctuaries is greatly added to by illegal occupation and activities.

The range of such illegal activities is very large (see section III:2.3 on recorded offences), but the very common ones seem to be habitat destruction, encroachment, hunting, and unauthorised grazing. Information was thus sought on the illegal occupation and use of parks and sanctuaries.

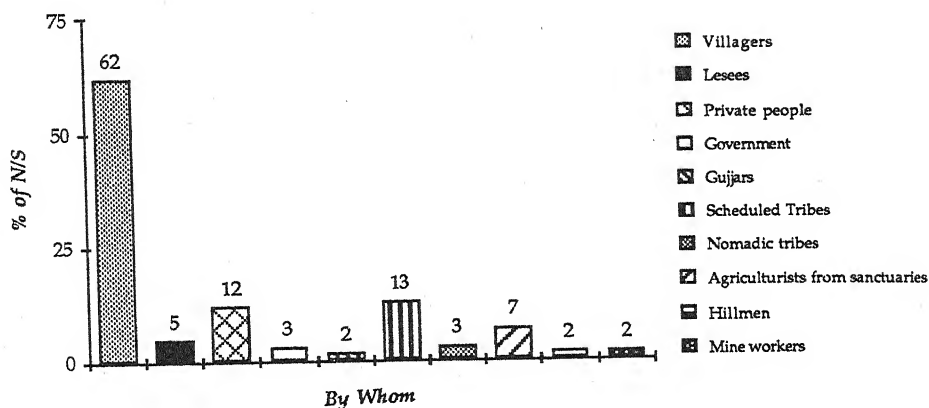
Of the 36 national parks and 176 sanctuaries that responded, 3 (8%) and 46 (26%) respectively reported incidence of illegal occupation or illegal use, or both. 'Occupation' in this context, means the spatial location of people or buildings, or both, while 'use' refers only to activities without involving spatial location of people or buildings.

The most frequently reported illegal use was cultivation, 37% of all reported cases (of illegal uses and occupations). Next came grazing (20%) and fishing (5%). The other illegal use activities were all below 5% of the total number of cases reported. Encroachment (20%), was the most frequent form of illegal occupation, followed by labour camps (2%) and temples (2%). Given below is a graphic representation of the frequency of each type of illegal occupation and use:



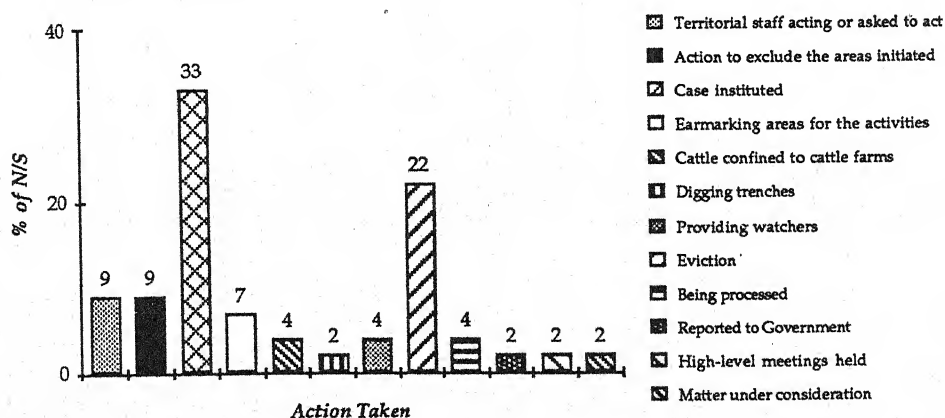
In response to the query 'by whom', villagers were said to be responsible in 52% of the cases, Scheduled Tribes in 13%, 'private persons' in 12%, agriculturists in 7% and lessees in 5% of the cases. The government and nomadic tribes tied for sixth place with 3% each. Gujjars, mineworkers and 'hillmen' were each mentioned in 2% of the cases. It might be noted that the term villager could also cover most of the other categories mentioned above. Given below is a graphic representation of the frequency of each kind of person/group held responsible for illegal use.

## ILLEGAL USE OR OCCUPATION: BY WHOM



The most frequent form of official action taken seems to have been the filing of cases (33%), followed by efforts at eviction (22%), efforts to exclude the concerned area from the park or sanctuary (9%), reporting to the territorial staff (9%), earmarking certain areas for the use in question (7%), impounding cattle, providing watchers, and matter 'being processed' (each 4%). 'matter under consideration', 'high level meeting', 'matter reported to government' and 'digging of trenches' each accounted for 2%. Given below is a graphic representation of the frequency of each type of action taken.

## ILLEGAL OCCUPATION AND USE: ACTION TAKEN



*Limitations of the Data:*

The terms 'illegal use' and 'illegal occupation' seem to have been narrowly interpreted by many of the park directors responding to the questionnaire. They have, for instance, not reported here several types of illegal activities which have been reported elsewhere by them in the questionnaire (see for instance data on recorded offences, Table III:2.3, or on illegal grazing, Table III:1.3; in both of these many more parks and sanctuaries have reported illegal activities than in this question). With hindsight, the terms 'use' and 'occupation' should have been defined more precisely in the questionnaire.

These data also do not tally with those of unauthorised grazing (Table III:1.3), of use and/or control by other Government departments (Table III:1.7a), and of rights and leases (Table III:1.2), especially in the case of national parks.

Though *prima facie* these activities cannot be judged in terms of their ecological impact, their illegality certainly seems to imply that they have not been evaluated and found acceptable.

**III:2.2 Encroachment**

3 (7%) of the 44 national parks and 32 (20%) of the 160 sanctuaries responding reported encroachment (extended database). These areas have been listed in Table III:2.2 along with information on what action has been taken about the encroachment.

In all three of the national parks and in 23 (72 %) of the 32 sanctuaries reporting encroachment, some action had been reportedly taken by the authorities. This, however, varied considerably. In many cases action taken meant initiation of correspondence between the different concerned departments, or filing of cases. Only one sanctuary (Parambikulam in Kerala) reported actual eviction of the encroachers.

*Limitations of the Data*

Many cases of encroachment seem to go unrecorded or unreported. The figures should therefore be taken as reflecting the minimum incidence.

**III:2.3 Offences**

Details regarding different types of recorded offences under the Wild Life (Protection) Act were collected for each park and sanctuary. These figures can be indicators of the human pressures on these areas. *Of the 45 national parks and 172 sanctuaries responding, 31 (69%) and 96 (56%) respectively reported incidence of one or more types of offences.*

Of the different types of offences, for national parks, destruction of habitat (average of 971 per park over the period 1979-84), illegal grazing/entry of cattle (369), causing fire hazards (38), illegal hunting (28) and improper entry (22) were the most common (Table III:2.3b). Similarly, for sanctuaries destruction of habitat (471), improper entry (221), illegal grazing/entry of

cattle (158), and causing fire hazards (22) were the most common. However, these averages do not give a very good picture, as variations between different areas was significant (See 'Range' in the table).

The extended data base has been used to list below all parks and sanctuaries which reported the incidence of two of the main threats to wildlife: destruction of habitat and illegal hunting, along with the total number of cases reported from each in the period 1979 to 1984. These do not match the averages given above as the averages have been worked out from the table annexed which covers a lesser number of areas.

### *Limitations of the Data*

These figures only reflect offences which have been detected and officially recorded. There could be many other offences which have not been detected, or not officially recorded. In a separate section of the Questionnaire, on the perceptions of the park or sanctuary in-charge, a question on the extent of unrecorded offences was asked. The response from many parks and sanctuaries indicated a significant level of such unrecorded illegal activities.

Secondly, the number of recorded cases of a particular offence in a park or sanctuary does not necessarily reflect the incidence of that offence in the area, nor do a higher number of recorded cases in a particular area necessarily reflect negatively on the efficiency of the protection staff. In fact, it is possible that in many instances a higher number of cases have been recorded in parks and sanctuaries where the protection staff is very active and detects and takes action on a larger proportion of the offences occurring.

Comparisons between different protected areas would also be invidious without analysing data on their relative areas, the existence of human pressures, the extent of such pressure, availability of personnel and facilities, etc.

Destruction of Habitat					
N/S	No. of Cases	N/S	No. of Cases	N/S	No. of Cases
AP/S/ETU	4	KER/N/PER	163	NAG/S/INT	8
AP/S/NEL	1	KER/S/NEY	92	*ORI/N/SIM	551
AP/S/PAK	17	KER/S/SHE	95	ORI/S/CHA	41
ARU/N/NAM	1	MAH/N/NAW	72	ORI/S/SIM	551
ARU/S/ITA	42	MAH/N/PEN	2	RAJ/N/KEO	465
ARU/S/LAL	18	MAH/N/TAD	513	RAJ/N/RAN	11138
ARU/S/PAK	5	MAH/S/DHA	2	*RAJ/N/SAR	1478
BIH/S/HAZ	109	MAH/S/MEL	2	RAJ/S/TOD	1176
*GOA/N/BHA	5	MAN/N/KEI	10	RAJ/S/VAN	138
GUJ/N/GIR	1719	MP/N/BAN	15	TN/N/GUI	212
GUJ/N/MAR	1	MP/N/KANH	1	TN/S/ANA	1749
GUJ/S/NAL	1	MP/N/MAD	925	TN/S/MUD	53
GUJ/S/NAR	34	MP/N/VAN	1	TN/S/MUN	2158
J&K/N/DAC	338	MP/S/ACH	2	UP/N/COR	76
J&K/S/JAS	2	MP/S/GAN	107	UP/N/DUD	265
J&K/S/RAM	36	MP/S/GOM	129	UP/S/KIS	5
J&K/S/SUR	6	MP/S/KHE	68	UP/S/MOT	481
KAR/N/BAND	411	MP/S/NAU	2391	UP/S/RAJ	582
KAR/N/BANN	285	MP/S/PAN	2	WB/N/SUN	767
KAR/N/NAG	838	MP/S/RAT	15	WB/S/JAL	1779
KAR/S/BLA	2	MP/S/SAN	38	WB/S/SAJ	763
KAR/S/SOM	718	MP/S/SIN	21		

## Illegal Hunting

N/S	No. of Cases	N/S	No. of Cases	N/S	No. of Cases
A&N/S/CRO	1	KER/S/WYN	19	MP/S/SIT	5
AP/S/COR	1	MAH/N/NAW	8	NAG/S/INT	7
AP/S/ETU	7	MAH/N/PEN	1	*ORI/N/SEM	62
AP/S/KOL	18	MAH/N/SAN	9	ORI/S/BHI	18
AP/S/MAN	1	MAH/N/TAD	1	ORI/S/NAN	1
AKU/S/PAK	4	MAH/S/DEU	3	ORI/S/SAT	6
BIH/S/DAL	1	MAH/S/DHA	23	RAJ/N/DES	43
BIH/S/GAU	2	MAH/S/GRE	2	RAJ/N/KEO	14
BIH/S/HAZ	1	MAH/S/KAR	1	RAJ/N/RAN	78
BIH/S/LAW	2	MAH/S/KIN	18	*RAJ/N/SAR	108
BIH/S/PAL	35	MAH/S/MEL	23	RAJ/S/DAR	23
BIH/S/VAL	4	MAH/S/TAN	1	RAJ/S/JAW	1
GOA/N/BHA	6	MAH/S/YAW	4	RAJ/S/KUM	15
GOA/S/BHA	6	MAN/N/KEI	2	RAJ/S/MOU	8
GUJ/N/BAN	1	MP/N/BAN	2	RAJ/S/RAM	1
GUJ/N/GIR	29	MP/N/KANH	29	RAJ/S/SIT	12
GUJ/S/DHR	10	MP/N/MAD	103	RAJ/S/TAL	2
GUJ/S/NAL	64	MP/N/PAN	1	RAJ/S/IOD	11
HP/S/CHA	1	MP/N/SAN	2	RAJ/S/VAN	1
HP/S/RUP	2	MP/S/ACH	7	SIK/N/KHA	3
J&K/N/KIS	1	MP/S/BAD	5	TN/N/GUI	13
J&K/S/NAN	1	MP/S/BAG	8	TN/S/ANA	32
KAR/N/BAND	6	MP/S/BAR	25	TN/S/KAL	23
KAR/N/BANN	6	MP/S/GAN	7	TN/S/MUD	5
KAR/N/NAG	22	MP/S/COM	3	TN/S/MUN	3
KAR/S/BHA	1	MP/S/KAR	1	UP/N/COR	17
KAR/S/BLA	1	MP/S/KHE	4	UP/N/DUD	186
KAR/S/DAN	4	MP/S/NAR	8	UP/S/GOV	26
KAR/S/MOO	1	MP/S/NAU	14	UP/S/KAT	82
KAR/S/RAN	2	MP/S/PAC	4	UP/S/KED	4
KAR/S/CHA	3	MP/S/PAL	2	UP/S/KIS	1
KAR/S/SHE	3	MP/S/PAN	17	UP/S/MOT	2
KAR/S/SOM	2	MP/S/PEN	51	UP/S/NAT	60
KER/N/PER	21	MP/S/RAT	12	UP/S/RAJ	2
KER/S/NEY	4	MP/S/SAN	2	WB/S/SAJ	10
KER/S/PAR	4	MP/S/SEM	2		
KER/S/SHE	6	MP/S/SIN	13		

\* Includes figures from sanctuary of same name

### III:3 CONFLICTS

#### III:3.1 Injury or Death to Human Beings

A disturbing aspect of the human pressures in and around parks and sanctuaries is the incidence of injury or death of human beings caused by wild animals.

Most parks and sanctuaries have large human populations in and around them. The chance of such incidents is heightened by the fact that in many of the parks and sanctuaries there is free entry and movement of people. The lack of boundary walls or fences, in most of the areas, contributes to this. In a large proportion of the parks and sanctuaries people graze cattle or carry out other types of activities (See sections III:1.2 and III:1.3), often illegally (see sections III:2.1 and III:2.2).

Apart from this, in some of the areas wild animals, perhaps in search of food and water, often cross the boundaries of the parks or sanctuaries and enter neighbouring fields and villages. This also results in confrontations.

*Of the 39 national parks and 167 sanctuaries responding, 14 (36%) and 49 (29%) respectively reported incidents of injury or death of human beings due to attacks by wild animals, either inside or adjacent to them. A total of 629 cases were reported for the five-year period (1979-84) of which 379 (60%) were reported from national parks and 250 (40%) were reported from sanctuaries.*

For this five-year period, Sunderbans National Park in West Bengal with 192 cases (189 involving tigers) headed the list of areas with high incidence. The Dudhwa National Park in Uttar Pradesh with 119, the Gir National Park in Gujarat with 25 and the Bandhavgarh National Park in Madhya Pradesh with 22 followed. Among sanctuaries, Pachmarhi in Madhya Pradesh reported 26 cases, Dalma in Bihar and Pamed in Madhya Pradesh reported 21 cases each, and Kaimur in Bihar 18.

Of the species of wild animals involved, tigers were responsible for 221 attacks (190 in West Bengal alone), bears for 68 (62 in Madhya Pradesh alone), elephants for 56 and leopards for 21 (15 in Gujarat). The other species involved were wolf, gaur, lion, crocodile, buffalo, hyena, wild boar, a snake and a shark. There was one case of a fatal attack by a nilgai!

**Fatal Cases:** Of the 629 cases reported, 485 (77%) were fatal. Of these 485 fatal cases, 329 (68%) were in national parks and 156 (32%) in sanctuaries. Seen another way, of a total of 379 cases reported from national parks and 250 reported from sanctuaries, 87% and 62% respectively were fatal.

**Compensation:** Andhra Pradesh, Arunachal Pradesh, Himachal Pradesh, Manipur and Rajasthan reported incidence of injury or death to human beings but did not pay any compensation\*. Among the states that paid compensation the amount varied from Rs. 10,000 to Rs 200 for fatalities and from Rs 1000 to the payment of medical expenses for injuries.

#### *Limitations of the Data*

First, the cases reported here are those which were officially recorded or brought to the notice of wildlife authorities. It seems plausible that many other cases, especially those not fatal, might not have been officially recorded. Also, there might be at least some cases of fatalities which occurred while the victim was indulging in illegal activities within the park or sanctuary and these might also have been hushed up by the victim's companions or relatives. The data, as such, must be seen as reflecting only the minimum number of cases.

In those states or areas where compensation is not paid, usually very scanty records are kept of such incidents. For one, there is little motivation for the affected people or their families to inform the wildlife authorities, and there is no laid down procedure for recording cases of such attacks. In Himachal Pradesh, for instance, there is evidence to believe that cases of injury or death to human beings have occurred, but as there was till recently no system of paying compensation, no official record was kept.\*

\* Himachal Pradesh has since started paying compensation, vide State Government Notification No. Fts(F)6-7/82-Loose, dated 13-8-1986.

### III:3.2 Clashes

The alienation of the local people from the natural resources around them and the inadequate alternative sources of fuel, fodder, water, timber and of earning a livelihood, often force the local people to make demands on the resources of parks and sanctuaries, thereby coming into conflict with park and sanctuary authorities. Sometimes vested interests also provoke, or directly participate in, such confrontations.

Whatever the reasons, very often conflicts over the use and control of natural resources become law and order problems and result in physical confrontations between the people and the authorities. 16 (37%) of the 43 national parks and 31 (17%) of the 179 sanctuaries responding, reported the incidence of such confrontations or clashes.

Of the 51 clashes reported in the period 1979-84 from national parks responding across the country, Madhya Pradesh reported 20 (39%), and Gujarat 12 (24%). For sanctuaries, of the 66 clashes reported, Madhya Pradesh had 23 (29%), West Bengal 21 (26%), and Gujarat 13 (16%).

A few of the parks and sanctuaries witnessed a fairly high number of clashes. The Gir National Park and Sanctuary in Gujarat reported 12 clashes. From Madhya Pradesh, Narsingarh Sanctuary reported 10 and Madhav National Park reported 18. In West Bengal Jaldapara Sanctuary reported 20 clashes.

The major reasons given for these clashes were: illicit felling of trees, poaching, illegal grazing, encroachments and other forest offences.

#### *Limitations of the Data*

These figures reflect only those clashes which were officially recorded because of their seriousness, or for other reasons. They, then, can at best be seen as reflecting the minimum number of clashes that occurred, and cannot be seen as representing a complete picture.

The reasons given for the clashes are those given by the wildlife authorities. A proper understanding of the reasons must include the people's versions, which have not been recorded in this report. Also not recorded is the outcome, or follow-up, of the clashes.

## IV. Management

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The primary objective in the management of national parks or sanctuaries is to accord 'better protection of habitat and the wildlife thereby creating conditions under which populations may reach a natural population density for purposes *including scientific, research, education, recreation and wildlife products*' (Kishore, 1987a). This chapter deals with some of the various aspects of the management of national parks and sanctuaries. It is divided into three parts: management planning; management practices; and management facilities and personnel.

### IV:1 MANAGEMENT PLANNING

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This part includes data on management plans, budgets and zoning. The effort is to first examine the more general requirements of park and sanctuary management which form the basis of detailed management practices discussed in the next part.

#### IV:1.1 Management Plan

The drawing up of management plans can be considered a crucial first step in the proper management of parks and sanctuaries. Apart from the plan itself, which ideally gives a framework within which protection of the area has to be enforced and monitored, the data collection and research that should precede the formulation of a plan is an important source of information on the area and a baseline from which to evaluate the subsequent 'health of the area'.

Ideally, the management plan should fit into the overall land use planning of the region, taking into account the relevant environmental, social and economic parameters relevant to both the park/sanctuary as well as the adjacent areas. Within the ambit of the park itself, the management plan should identify the major objectives of the park/sanctuary, assemble comprehensive background data, establish the relationship of different factors to each other, identify the priority areas and strategies for protection and management, and indicate suitable locations for buildings and facilities. The plan should seek to ensure that the management requirements, goals and objectives, are considered carefully before initiating action and that planning is done with a long-term perspective in mind, thus protecting the park from the effects of piecemeal and *ad hoc* management practices.

*Of the 52 national parks and 208 sanctuaries responding (extended data base), 26 (50%) of the parks and 65 (31%) of the sanctuaries reported the existence of management plans. In all the other areas management was carried*

out, in so far as it was, on an *ad hoc* basis with an annual perspective, rather than a five or ten yearly one.

Most areas that reported the existence of management plans did not respond to the question on whether the plan had been approved or not. Only 5 national parks and 18 sanctuaries stated that their plan had been approved, while 3 parks and 12 sanctuaries reported that theirs had not yet been approved.

#### *Limitations of the Data*

The data only indicate the existence of management plans and not their comprehensiveness or appropriateness. Judging from copies of management plans sent in for many of the areas it appears that, but for a few exceptions, these plans are little more than a budget with a general introduction. Moreover, in some cases the plans cited are old, e.g. of the 1970's, and it is unclear whether and how they are being followed at present.

The data on approval of management plans are obviously scanty, but from field visitors' experience it appears that a majority of the plans which are made have never been approved, and the required budgetary allocations in full, and in time, are not always forthcoming.

#### IV:1.2 Separate Budget

As an important indicator of management practices, the existence of a separate budget for each national park and sanctuary was queried. Not having a separate budget implies that the expenditure on the park or sanctuary comes out of the larger budget for the forest/wildlife division, without funds being exclusively allocated for expenditure on the park or sanctuary. This might also mean having very little funds, or no funds at all, to spend on the park or sanctuary. It then becomes difficult to plan ahead and take up long-term projects, and the park directors' financial powers are greatly limited.

The extended data base was used to list out all the national parks and sanctuaries which have a separate budget. This list reveals that of the 51 national parks and 205 sanctuaries responding, 34 (67%) and 116 (57%) respectively, reported having separate budgets.

Andaman and Nicobar Islands, and Goa reported that separate budgets were not made for any of their national parks or sanctuaries.

#### *Limitations of the Data*

Without a detailed analysis of the actual expenditure on each park or sanctuary, something that has not been attempted in this report, it is not possible to conclude that areas with separate budgets get a higher level of funding than those without it. However, barring exceptional cases, it can generally be argued that separate budgets are desirable and are one of the essential instruments of long-term planning for parks and sanctuaries.

#### IV:1.3 Zoning

The division of national parks and sanctuaries into a buffer zone (BZ), and a core zone (CZ) or *sanctum sanctorum*, is usually prescribed as essential to the proper management of these areas. It is an important way of reconciling the often conflicting demands of conservation and human activities, by allowing restricted activities in the BZ while keeping out most human uses from the CZ.

The report of the task force on eliciting support for wildlife conservation, set up by the Indian Board for Wildlife, says

Of over-riding and primary importance is the need for each individual reserve to adopt a 'Core-buffer-multiple use surrounds' structure, wherein a restricted forest i.e. buffer surrounds the core insulating it from an outer multiple use area, the last comprising forests and villages where land use practices are compatible with wildlife conservation. While protection must be enforced in the core-buffer area, the multiple use surrounds should be subjected to rapid multilateral eco-development capable of enhancing the agricultural, pastoral and forest productivity of the area and to provide supplemental alternative resources. This is the only way in which compatibility of each area with the others can be brought about (Indian Board for Wildlife, 1983).

Among the parks and sanctuaries responding, at least the following four types of zoning practices were found

- Where both the buffer and core zone are inside the notified park/sanctuary.
- Where the park/sanctuary is designated the core zone, and an area surrounding it or adjacent to it, but outside the notified park/sanctuary, is considered a buffer zone.
- Where a national park is designated the core zone and sanctuary surrounding it or adjacent to it is designated as buffer zone.
- Where the notification designates both the core zone and the buffer zones, but only the core zone has been taken over for management as park/sanctuary while the buffer zone remains outside the managed area.

18 (38%) of the 48 national parks and 41 (19%) of the 221 sanctuaries responding, reported the existence of at least one of these four types of zoning.

#### *Limitations of the Data*

At least for some of the parks and sanctuaries, zoning might not be required as there is no human population or human activity in and around the area.

These figures show the existence only of core and buffer zones. However, in a few areas there are also tourist zones, which are not reflected separately here. The areas with tourist zones have been considered, for the purpose of this report, as areas having zones.

The existence of a core zone in a park or sanctuary does not necessarily mean that it actually functions as a *sanctum sanctorum* for wildlife. In fact, in a number of parks and sanctuaries, villages and tourist facilities, among others, are located within the core zone.

## IV:2 MANAGEMENT PRACTICES

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While habitat and species protection is a vital part of the management of national parks and sanctuaries, it is increasingly being realised that this alone is at times not adequate since active intervention is often needed to deal with natural or human-caused phenomena such as forest fires, floods, droughts, air and water pollution, invasion by exotics, as also to manage the direct human pressures on the area.

In a country like India, the management and control of human activities in and around national parks and sanctuaries assumes great importance. In previous chapters the various human pressures on protected areas have been described: private rights and leases, uses by other government agencies, grazing, forestry, tourism, and so on. Here data on some of the management practices relevant to these activities are given, including the plantation of fuel and fodder species to reduce the pressure on natural forests (section IV:2.1), the relocation of human populations (section IV:2.2), vaccination of cattle (section IV:2.6), and control of tourism (section IV:2.7). Also presented is information on the policies on and rates of compensation paid for the killing or injuring of livestock, and the damage to crops, by wild animals (sections IV:2.3 and IV:2.4). In very rare circumstances, permission is given to hunt wild animals inside national parks and sanctuaries, data on which are also given below (section IV:2.5).

Two crucial prerequisites and components of proper management of a protected area are research and monitoring. Data obtained on these aspects is presented in sections IV:2.8 and IV:2.9, while section IV:2.10 deals with a related topic, the association of outside experts with parks and sanctuaries.

Equally important in the management of a protected area is the orientation and education of tourists, and good public relations with the surrounding population. This necessitates adequate orientation facilities, educational and extension activities, educational material, trained staff, and other similar aids. Data were obtained on the following, which are presented below: literature on parks and sanctuaries (section IV:2.11), availability of maps (section IV:2.12), audio-visual programmes (section IV:2.13), use of trained guides and extension officers (sections IV:2.14 and IV:2.15), and educational programmes for local people (section IV:2.16).

As important as the management of human activities is the management of flora, fauna, and habitat of parks and sanctuaries. Unfortunately data on this were not easily forthcoming, and it has been possible to present data on only some of its aspects. These include the introduction of floral species (section IV:2.17), and the artificial breeding, introduction, and re-introduction of fauna (sections IV:2.18, IV:2.19, and IV:2.20). Also included is some information on the management of factors affecting the habitat, like forest fires, floods, droughts, and water pollution (section IV:2.21).

#### IV:2.1 Plantation for Fuel & Fodder

As noted in the section on rights and leases of villagers and others (section III:1.2) and in the section on timber and minor forest produce extraction (section III:1.5), timber, fuel and fodder are extracted from several of India's parks and sanctuaries for commercial use, and for providing the needs of the urban and rural populations.

One method of reducing pressure on the ecosystem is to develop alternate sources of fuel, fodder and other raw materials through plantations of suitable species outside parks and sanctuaries.

*Nationwide, only 2 (7%) of the 30 national parks responding and 20 (15%) of the 134 sanctuaries responding have reported such plantations. In terms of the kind of plantation done, both the national parks had fodder plantation, while of the 20 sanctuaries with plantation, 12 (60%) had fuelwood and 9 (45%) fodder plantation (some had both).*

#### IV:2.2 Relocation of Human Population

As noted in the chapter on human population (section III:1.1) a very high percentage of our parks and sanctuaries have human population inside them. Attempts have been made to relocate part or all of this population from a few parks and sanctuaries, as a means of reducing human pressure on these areas.

*Of the 16 national parks and 88 sanctuaries which have human population inside them and which have responded to this question, 5 (31%) of the parks and 4 (5%) of the sanctuaries had proposed to relocate a part or whole of their population prior to 1984.*

*Actual relocation till 1984 has been done in 4 (25%), of the national parks and 3 (3%) of the sanctuaries having human population and responding. This represents 80% of the parks and 75% of the sanctuaries where relocation was proposed. This does not however mean that relocation has been complete, i.e. that all the villages proposed for relocation have been shifted. Such complete relocation had been done by 1984 in only one area: Gandhi Sagar Sanctuary (MP) where, because it is a reservoir, this was inevitable.. In the case of Bor Sanctuary (MAH) it was almost completed (10 of 11 villages having been shifted). Similarly most of the villages from Dudhwa National Park (UP), and Satpura National Park (MP) had been relocated. The situation in two other areas where relocation has been done, Bannerghatta National Park (KAR) and Topchanchi Sanctuary (BIH), is unclear as the data given does not include the number of villages proposed to be relocated in each.*

*Post-1984 relocation has been proposed in the case of 6 national parks (38% of those having human population and responding), and 13 sanctuaries (15%). These include the same parks and all but one of the same sanctuaries for which relocation was proposed prior to 1984. In effect, relocation has been proposed prior to or after 1984 in 6 (38%) of the national parks, and 14 (16%) of the sanctuaries having population and responding.*

### *Limitations of the Data*

As mentioned above, where relocation has been proposed or actually done, it has not necessarily been proposed or done for the entire population existing in the park or sanctuary. This information, therefore, does not indicate whether human habitation has been completely removed from any area or not. It is also not possible from these data to judge the impact of relocation on the park or sanctuary, nor to comment on the nature or efficacy of the relocation itself.

#### IV:2.3 Compensation Payable for Injury or Death of Livestock

One of the major problems inherent in the management of India's national parks and sanctuaries is that very often some of the wild animals sought to be protected adversely affect the interests of the local people. Wild animals causing injury to or death of humans and cattle, and damage to crops, are common examples of this. Such incidents occur frequently in and around a number of parks and sanctuaries. One of the measures taken to offset or reduce the loss these entail, and to discourage the villagers from attacking the wild animals involved, is the payment of cash compensation to the affected villagers. Whether such compensation is payable and, if so, details of the amount payable and actual cases of payment, were asked for in the questionnaire.

10 (22%) of the 45 national parks and 57 (31%) of the 182 sanctuaries responding have reported that compensation is payable for injury or killing of livestock by wildlife within a park or sanctuary. Corresponding figures of compensation payable for livestock injured or killed in adjacent areas are 20 (44%) of the 45 parks and 59 (32%) of the 182 sanctuaries responding. Combining the two, what emerges is that 9 (20%) of the parks and 46 (25%) of the sanctuaries responding have compensation payable for livestock injured or killed both within and in areas adjacent to them.

The amount of compensation payable varies considerably both between and within states. For a cow injured or killed *within* a park or sanctuary, the amount ranges from Rs. 100 in a sanctuary in Bihar to Rs. 5000 in some sanctuaries in Kerala. Rates of compensation for other livestock injured or killed within a park or sanctuary range from Rs. 25 to Rs. 5000 for a buffalo, Rs. 18 to Rs. 500 for a goat, and Rs. 25 to Rs. 500 for a sheep. For livestock injured or killed in *adjacent* areas, the rate ranges from Rs. 100 to Rs. 5000 in the case of a cow, Rs. 15 to Rs. 5000 for buffalo, Rs. 18 to Rs. 500 for goat, and Rs. 25 to Rs. 500 for sheep. One curious fact in the case of some sanctuaries in Madhya Pradesh is that if a tiger kills a head of livestock, the compensation payable is Rs. 2000, whereas if a leopard kills the same livestock, compensation payable is only Rs. 500.

The most common wild animal responsible for such damage is the tiger, followed by the leopard. Some of the other species responsible are wolf, bear, wild dog, and elephant.

*Limitations of the Data*

The national figures given for compensation payable for injury/killing of livestock might not present a completely accurate picture. Several of the parks and sanctuaries in which compensation is not payable may have such a policy or practice simply because such injury or killing is not possible, e.g. where no livestock exists within or adjacent to it, or where no animal exists which could cause such damage.

The data here do not give an idea of the prevalence of incidents of cattle injury or killing, mainly because of a mistake in the framing of the question — details of such incidents were asked for only in the case of areas where compensation is payable. It is, therefore, likely that the number of parks and sanctuaries where such damage occurs is higher than those where compensation is payable.

The rates of compensation payable may include compensation not only for death of livestock but also for their injury. It is possible that the wide range of compensation rates payable, as detailed above, is due to this confusion between death and injury. This again, is mainly a fault in the question, which was not framed sufficiently clearly.

**IV:2.4 Compensation for Damage to Crops**

2 (5%) of the 43 national parks and 19 (10%) of the 188 sanctuaries responding reported that compensation is payable for damage to crops by wildlife within the park or sanctuary. The corresponding figures for crop damage in adjacent areas are: 5 (12%) of the 43 national parks and 26 (14%) of the 188 sanctuaries responding. Compensation is payable for damage both within and in areas adjoining a park or sanctuary in only 1 (2%) of the 43 national parks and 18 (10%) of the 188 sanctuaries responding.

*Limitations of the Data*

The national figures given for parks and sanctuaries where compensation is payable for crop damage do not present a completely accurate picture, for the same reasons given above for livestock damage, i.e. that it may not be relevant where such damage cannot occur (e.g. where there is no cropping).

The data also do not give an idea of the actual incidence of crop damage, because due to a mistake in the framing of this question, those sanctuaries or parks where compensation is not payable were not asked to provide details of such damage. As in the case of livestock damage, the number of parks or sanctuaries where crop damage does occur is likely to be higher than the number where compensation is payable.

Whereas, in the case of livestock damage, rates of compensation payable could be presented, corresponding rates for crop damage cannot be presented because the compensation paid is dependent on the amount of crop damage, there being no flat rates for this. The data on compensation paid in actual cases of damage were too scanty to be presented here.

#### IV:2.5 Hunting Permits (No table)

The Wild Life (Protection) Act allows the issue of permits for hunting of wild animals inside national parks or sanctuaries under very special circumstances (Sections 29 and 35 (6)). For sanctuaries, it says

Provided that if the Chief Wild Life Warden is satisfied that it is necessary that any wild animal in a sanctuary should be hunted or removed,

- (a) for the better protection of wild life, or
- (b) for any other good and sufficient reason,

he may, with the previous approval of the State Government, grant a permit authorising any person to hunt or remove such wild animal under the direction of a an officer authorised by him or cause it to be hunted or removed. (Section 23 of the Act)

In the case of national parks, it says

No person shall destroy, exploit, or remove any wild life from a National Park or destroy or damage the habitat of any wild animal or deprive any wild animal of its habitat within such National Park except under and in accordance with a permit granted by the Chief Wild Life Warden and no such permit shall be granted unless the State Government, being satisfied that such destruction, exploitation or removal of wild life from the National Park is necessary for the improvement and better management of wild life therein, authorises the issue of such permit. (Section 35(6) of the Act)

*Only 2 (5%) of the 43 national parks responding and 3 (2%) of the 187 sanctuaries responding reported the issuing of hunting permits (for killing or collecting). The details are given below.*

N/S	No. of Permits	Animal and Numbers Involved	Reasons
Bhimbandh S. (Bihar)	11	Wild boar (11)	To stop crop damage
Bhittar Kanika S. (Orissa)	2	Collection of Olive ridley turtle eggs (530)	Research
Simlipal S. (Orissa)	1	Tiger (1)	Man-eater
Ranthambore N. (Rajasthan)	5	Wild boar (6)	Unspecified
Dudhwa N. (Uttar Pradesh)	1	Tiger (1)	Man-eater

#### IV:2.6 Vaccination of Cattle

Disease-carrying domestic cattle, while grazing in or passing through parks and sanctuaries, have been known to infect wild animals and occasionally cause epidemics. Where grazing and moving of cattle through parks and sanctuaries cannot be totally stopped, and where the consequent direct or indirect contact between wild animals and domestic cattle also cannot be prevented, one of the ways of controlling the spread of diseases is by vaccinating the cattle.

*Of the 45 national parks and 193 sanctuaries responding, 16 (36%) and 53 (27%) respectively reported the practice of vaccinating cattle. To get the proper significance of this data, it needs to be compared with data concerning the existence of grazing within parks and sanctuaries. The extended data base*

was used for this, the results of which are presented in Tables IV:2.6a and IV:2.6b.

From Table IV:2.6a it can be seen that of the 11 national parks which reported grazing by livestock living *within* their boundaries, only 1 (9%) reports a programme of vaccination. This is Bandhavgarh National Park (MP). The corresponding figure for sanctuaries is 20 (22%) out of 90.

Table IV:2.6b shows that a much higher percentage of parks and sanctuaries reported vaccination of cattle grazing within their boundaries but residing *outside*: 6 (75%) of the 8 national parks and 35 (35%) of the 100 sanctuaries.

#### *Limitations of the Data*

These data only reflect the existence of the practice of vaccinating cattle. It cannot be *prima facie* deduced that even where vaccination is done, all or an adequate number of the cattle have been covered, and covered often enough.

#### IV:2.7 Say of Wildlife Wing in Areas to be Opened for Tourism and in Mode of Travel and Activities of Tourists

The Wild Life (Protection) Act lays down (Section 28) that entry into a sanctuary or national park for tourism will only be with the permission of the Chief Wild Life Warden. Other sections of the Act give the Chief Wild Life Warden control over all other types of activities in parks or sanctuaries (Sections 29 to 33, 35(6)). Information was sought on whether the wildlife authorities have control over tourism in terms of where tourists can go, how and when.

*Of 39 national parks and 179 sanctuaries responding, 32 (82%) and 121 (68%) respectively reported that the wildlife authorities have a say in areas to be opened to visitors. Similarly, of 41 national parks and 184 sanctuaries responding, 34 (83%) and 133 (72%) respectively reported wildlife authorities having a say in mode of transport and other activities of visitors.*

#### *Limitations of the Data*

These figures only represent cases where the wildlife wing has a 'say', the cases where they have a 'total' or 'the final' say would probably be less, despite the provisions of the Act. In some states, like Himachal Pradesh, all or many of the national parks and sanctuaries were till recently managed by the territorial wing of the Forest Department and had not been handed over to the wildlife wing at all.

#### IV:2.8 & 2.9 Research and Monitoring

Research on flora, fauna, habitat and ecological processes is an essential component of the initial planning for a national park or sanctuary. In addition, monitoring of evolutionary and ecological changes, and of the human impact on ecosystems, can provide crucial data for continuous planning and management.

Research within parks and sanctuaries also provides data and insights which are of general, or national, value. It can contribute to the national inventory of flora and fauna, and to a mapping of the genetic resources available in the country. It can also help in mass education programmes related to wildlife and ecosystem conservation. Information was therefore sought on past and present research and monitoring efforts.

16 (42%) of the 38 national parks responding and 38 (23%) of the 166 sanctuaries responding reported that research work had been undertaken or was under way. Monitoring was reported from 9 (20%) of the 46 national parks and only 21 (11%) of the 193 sanctuaries responding.

#### *Limitations of the Data*

From this information nothing can be gleaned on the scope and quality of research and monitoring. These probably vary considerably. For example, the monitoring activities reported from many areas were limited to an occasional census of large mammal species.

#### **IV:2.10 Association of Outside Experts**

As stated in the section of this report on Research (section IV:2.8) and on Research Facilities (section IV:3.5), most national parks and sanctuaries have very little or no research facilities. In such a situation the collaboration of researchers and wildlife experts from outside the wildlife or forest departments becomes especially important. Details of such association were obtained from those few parks and sanctuaries where it had taken place.

Nationally, only 3 (7%) of the 42 national parks and 22 (12%) of the 183 sanctuaries responding have had outside experts working in them. The 3 national parks with such association are Dachigam in Kashmir, Bannerghatta in Karnataka and Van Vihar in Madhya Pradesh, though in the case of the latter two, the association was more for the animal enclosures than for any research or work on wildlife.

The 22 sanctuaries reporting association of outside experts are: Nagarjunasagar (AP), Bhimbandh and Palamau (both BIH), Nalsarovar (GUJ), Sultanpur (HAR), Kanawar, Manali, and Tirthan (all HP), Black Buck (Ranebennur) (KAR), Thattekkad (KER), Dhakna Kolkaz and Great Indian Bustard (both MAH), Karera (MP), Hadgarh and Satkosia Gorge (both ORI), Jawahar Sagar, National Gharial, and Tal Chapper (all RAJ), Anamalai, Mundanthurai, and Point Calimere (all TN), and National Chambal (UP).

About two-thirds of the experts mentioned were Indian, and one-third foreign.

*Limitations of the Data*

It is quite likely that the figures presented reflect only a bare minimum of such association, for much research or other work by outside experts may not have been reported at all. This could be because the present park or sanctuary authorities may be unaware of past work, or because only prominent, long-term involvements may have been recorded ignoring less conspicuous work by researchers and students. The information also does not reflect the usefulness, or otherwise, of the association. Protected areas with which outside experts have been associated are, therefore, not necessarily better researched or managed than those without such an association.

## IV:2.11 Literature on Parks and Sanctuaries

An important function of national parks and sanctuaries is to raise the level of awareness of visitors regarding fauna and flora and to help develop an understanding of, and a sensitivity to, the natural environment. One method of achieving this is through published material giving information about the area and about the plants and animals to be seen. This not only enhances the visitor's ability to understand what they see on the spot but continues to provide information afterwards.

*Of the 46 national parks and 196 sanctuaries responding, 26 (57%) and 41 (21%) respectively reported the availability of booklets on the area, and/or checklists of birds or other animals.*

*Limitations of the Data*

This information does not give an idea of the quality and appropriateness of the published material available on parks and sanctuaries. Indeed, there is quite a wide variation in this, from one-page brochures and simple checklists to detailed booklets (though the latter are rare). Also, the aims and foci of the material differs significantly from area to area, some stressing conservation, others tourism, some highlighting a few major species, others giving a glimpse of entire ecosystems.

## IV:2.12 Availability of Maps

An essential prerequisite for managing and monitoring a park or sanctuary is the availability of proper maps, indicating the vegetation, physical features, water points, wildlife distribution, roads, fire lines, villages and the numerous other features found in each area. Such maps would also be of use to tourists and researchers.

*Of the 43 national parks and 191 sanctuaries responding, 38 (88%) and 146 (76%) either reported the availability of a map or sent a map along with their questionnaire, as requested. In a number of cases the park and sanctuary authorities stated in the questionnaire that no maps were available of the area, but sent a map along with the questionnaire. All such areas have been shown as having maps.*

### *Limitations of the Data*

A large proportion of the maps sent with the questionnaire have the barest of details, usually only the boundary and the streams and rivers. Very few of the areas seem to have accurate maps showing any more detail. Also, in many cases there seem to be only a few copies of the map, thus restricting their availability to visitors and researchers. It seems that in many cases the local wildlife staff members do not have access to Survey of India toposheets relevant to their area.

#### **IV:2.13 Audio Visual Programmes for Visitors**

Audio-visual programmes can greatly facilitate the process of educating tourists to parks and sanctuaries, since they are extremely effective in capturing and holding attention. Usually there is time during midday and after sunset when visitors, especially those who are staying overnight, have little to do and could well benefit from a film or slide show on various aspects of nature.

*Of the 46 national parks and 199 sanctuaries responding, 18 (39%) and 20 (10%) respectively reported having film or slide shows for visitors. Most of the others reported the absence of the necessary equipment and material for such shows.*

### *Limitations of the Data*

The above figures may, on the one hand, not be as low as they appear, since many parks and sanctuaries have very few or no visitors, hence film/slide shows there would be pointless. On the other hand, in many parks and sanctuaries such shows are held very infrequently, e.g. during the wildlife week, hence they would not be in the same category as areas where shows are regularly and frequently held (e.g. Keoladeo Ghana National Park, Rajasthan). The number of protected areas with regular shows is likely to be much less than the figures above.

One tourist facility which has generally been left out of the information collected is an interpretation centre. Such centres do exist in some parks and sanctuaries, notably Gir, Bandipur, and Keoladeo Ghana National Parks.

#### **IV:2.14 Trained Guides**

A trained guide to help visitors interpret what they see can go a long way in achieving the goal of tourist education. The guide can also teach visitors how to behave in a park or sanctuary and can ensure that disturbance and destruction by them is kept to the minimum.

In addition, a system of guides could provide employment to local people, who are often very knowledgeable about the area's ecosystem and wildlife. This could help significantly in reducing the people's alienation from the parks and sanctuaries created in their midst.

*Of the 45 national parks and 167 sanctuaries responding, only 11 (24%) and 15 (9%) respectively reported the availability of trained guides.*

*Limitations of the Data*

In some cases persons shown as trained guides were actually forest guards. It is possible that they may have considerable knowledge of the flora and fauna of the area, but they have essentially been trained as forest guards and not as guides.

**IV:2.15 & 2.16 Extension Officers and Education Programmes for Local People**

Considering the huge human population in and around parks and sanctuaries (see Table III:1.1), it seems essential that this population be made sensitive to, and supportive of, the need and effort for conserving wildlife and wilderness areas. Without the active co-operation of the local population it would be difficult to give anywhere near the required level of protection to parks and sanctuaries.

One of the ways of enthusing the local population is to run educational programmes where they are informed of the reasons for setting up parks and sanctuaries, of the potential benefits of these areas to them, and of the care and attention such areas require. Such educational programmes are mostly known as extension programmes, run by extension officers.

*However, of the 43 national parks and 170 sanctuaries responding, none of the parks and only 6 (4%) of the sanctuaries reported the presence of extension officers. A larger number of parks and sanctuaries reported educational programmes for villagers: 9 (20%) of the 44 national parks and 23 (12%) of the 197 sanctuaries responding.*

*Limitations of the Data*

Field visits to many areas indicate that the frequency of these educational programmes is often low and in many cases there is no regular schedule. The content of, and the response to, these programmes also needs to be studied.

**IV:2.17 Introduction of Flora**

The introduction, deliberate or accidental, of exotic species of flora into an ecosystem is normally considered detrimental to the well-being of that ecosystem. Certainly in an area protected for its value as a wildlife habitat such introduction can be ecologically justified only in such exceptional cases where it is established to be of benefit to the ecosystem and its living components, mainly as remedial measures for earlier human-caused damage. Park or sanctuary authorities were asked to provide details of deliberate introduction, if carried out in their area, including the species chosen and the purpose for introducing them.

*7 (16%) of the 43 national parks responding to this question, and 37 (19%) of the 192 sanctuaries responding, reported introduction of flora. These 7 national parks are: Dachigam (J&K), Bannerghatta (KAR), Periyar (KER), Sanjay Gandhi (MAH), Keoladeo Ghana (RAJ), Corbett (UP), and Sunderbans (WB). Only in Corbett, this was after the area was declared a national park. In*

*Periyar and Keoladeo it was when they were sanctuaries. Dates were not available for Bannerghatta.*

Of the plants introduced, the most common by far are species of *eucalypt*, having been planted in 3 of the 7 national parks and 15 of the 47 sanctuaries where such introduction has been done. In most cases *eucalypt* has been planted for industrial use.

#### *Limitations of the Data*

This question does not seem to have been clearly understood by many of those responding, perhaps because it was not made explicit in the question that information was being sought regarding introduction of only those species that are exotic to the area. Due to this, many species which are not exotic have been mentioned in response to this question. On the other hand, from many parks and sanctuaries plantation of exotics have not been reported in response to this question, though the same parks and sanctuaries have mentioned, in a separate question on plantations (see section IV:2.1), the planting of exotics. Several field visits conducted have also recorded the existence of exotic species in parks and sanctuaries which have not reported them in response to this question. A practice that is widely prevalent is the planting of ornamental shrubs and trees, often exotic, around forest rest houses and tourist complexes; this practice seems to have gone largely unreported here.

Another limitation is that the data given here do not reflect the impact of introduction of flora into a park or sanctuary. It is thus not possible to say how extensive the impact is, and with what results.

#### **IV:2.18 Captive Breeding of Fauna**

Though in a natural ecosystem animal populations perpetuate themselves through free breeding, there may be instances when captive breeding becomes essential. This usually happens when a species is endangered and individuals of that species need to be released into the wild after being bred in captivity. Such breeding of fauna has been tried out in some parks and sanctuaries. 7 (16%) of 44 national parks and 29 (15%) of 192 sanctuaries responding have answered this question in the affirmative.

However, apart from the breeding of crocodiles and gharials, most of the other breeding programmes mentioned are for, or inside, zoos and animal enclosures, and not for release into the wild. Most of the programmes for breeding and releasing crocodiles and gharials seem to have been fairly successful, as can be seen from the table.

#### *Limitations of the Data*

From the information provided it is not possible to judge the quality of the breeding programmes, especially in terms of the genetic viability of the breeding stock (For guidelines on captive breeding see Singh, Shekhar, et al., 1988, section on Captive Breeding).

**IV:2.19 & 2.20 Introduction and Reintroduction of Fauna**

Introduction of fauna refers to the release by humans of animals into an ecosystem to which these animals are not indigenous. Such introduction could be accidental or deliberate. If the latter, it could be for one of several reasons—the introduced species may be economically useful, it may have aesthetic value, or it may simply be an object of someone's whims. It is usually difficult to justify introduction of a species on ecological grounds, for the result of such an introduction is mostly a disruption of the ongoing ecological processes of a natural ecosystem. Such an ecosystem has a complex and stable web of relationships between its various components, a balance which the entry of an alien element could easily upset.

The history of faunal introductions by humans is full of disasters—rabbits in Australia, dogs in Mauritius, Spotted deer in the Andamans. Animals exotic to the place of introduction have usually either died out because the new habitat was not hospitable, or have caused great ecological damage, mainly because in the absence of natural predators, they have multiplied rapidly and overrun or displaced many indigenous species. However, in certain cases introduction of fauna may be ecologically justified, as in the attempt to redress an imbalance created earlier. Thus for instance an exotic species which has been introduced earlier and has become a nuisance could be checked by introducing its natural enemies from its original habitat. Such a step requires a thorough understanding of the ecosystem into which the species is being introduced, the habits of the introduced species, the potential impact of its introduction and many other factors. In the absence of such an understanding, introduction of exotic species is always risky.

Far more justifiable is the release of animals into an ecosystem to which they are or were indigenous. This is what is referred to here as reintroduction of fauna. The attempt is usually to 'restock' the ecosystem with an element which has at some point been a part of its ecological web but whose population has either been destroyed or declined considerably leaving a gap in the web\*.

Reintroduction does not pose the same level of risk to the ecosystem as introduction of exotics, it is nevertheless fraught with many uncertainties. Human understanding of the complex inter-relationship within an ecosystem is still extremely limited.

Various factors like the number and composition of animals to be reintroduced, the time and place of reintroduction and their effect on the ecosystem are all difficult to determine perfectly, especially where a particular species might have declined or died out naturally and not because of human interventions. An understanding of all these factors is also relevant to the proper design of a reintroduction strategy. Very many reintroduction

\* While 'reintroduction' usually refers to an attempt to restock a species which has become locally extinct, here it has been defined to include augmentation of populations which have declined considerably.

attempts have failed due to an inadequate understanding of these factors.

While the conceptual distinction between introduction and reintroduction is clear, in practice there is a likelihood of confusion. One problem is the difficulty in establishing whether or not an ecosystem has at any time in the past been the natural habitat of the species sought to be released. For example, it may be thought to be exotic till indications of its earlier presence are found, in which case its status would change from 'introduced' to 'reintroduced'.

Whatever the difficulties and uncertainties, both introduction and reintroduction of fauna species have important implications for the management of wildlife habitats.

Separate questions were asked on the introduction and reintroduction of fauna in India's national parks and sanctuaries. Several parks and sanctuaries reported details of animals released not into the wild but into enclosures. In some cases it was not clear where the animals were released; some specified that release was only proposed. Excluding all such cases, *introduction of fauna has been reported from 3 (7%) of the 46 national parks and 10 (5%) of the 197 sanctuaries responding. Reintroduction has been reported from 4 (9%) of the 43 national parks and 10 (5%) of the 194 sanctuaries responding.*

Details of species *introduced* are not very clear, barring some instances (please see *Limitations of the Data* below). The only species exotic to India as a whole is the Red deer (*Cervus elaphus* Linn.), introduced half-a-century ago in Chail Sanctuary in Himachal Pradesh. A 'few pairs' were released 'for pleasure' and now number 24. Some of the other species reported as introduced seem to be 'locally' exotic, such as Black buck (*Antelope cervicapra*) and Sambar (*Cervus unicolor*) in Nandini Sanctuary in Kashmir.

Of the fauna *reintroduced*, the most common is the Chital (*Axis axis*), reportedly released in five areas—Sanjay Gandhi National Park in Maharashtra, Periyar National Park in Kerala, Neyyar Sanctuary in Kerala, and Jaldapara and Bethuadahari Sanctuaries in West Bengal.

Various species of crocodiles have also been re-introduced in more than one area. The Marsh crocodile (*Crocodylus palustris*) has been released in tanks in Mount Abu and Van Vihar sanctuaries in Rajasthan (incidentally both reported under 'introduced' species), the Saltwater crocodile (*Crocodylus porosus*) in Coringa Sanctuary of Andhra Pradesh, and the Gharial (*Gavialis gangeticus*) in the Ken Gharial Sanctuary of M.P. and the Jawahar Sagar Sanctuary of Rajasthan. Some other significant reintroductions are the One-horned rhinoceros (*Rhinoceros unicornis*) into Dudhwa National Park in Uttar Pradesh, and the Asiatic lion (*Panthera leo*) into Chandraprabha Sanctuary in Uttar Pradesh (the latter mentioned under 'introduced' species).

Of these the rhino's is a very recent reintroduction (1984) and it may be a little early to judge its success (7 of the 9 rhinoceros have survived so far)\*. The

\* For a recent detailed evaluation of the management of this project, commissioned by the Ministry of Environment and Forests, Government of India, see Kothari, A., et al. 1988.

lion reintroduction was done in 1957, to find another home for the Asiatic lion in an area which was once part of its range. The lions have however disappeared ('migrated', according to the response provided!).

#### *Limitations of the Data*

Some shortcomings have been referred to above, the most important being the misunderstanding of the terms 'introduced' and 'reintroduced'. The national breakups provided here are therefore misleading. In the case of 'introduction of species' for instance, a survey of the species mentioned indicates that perhaps only 1 of the national parks and 2 of the sanctuaries have done this, not 3 parks and 9 sanctuaries as reported. On the other hand many species mentioned as 'introduced' are actually in the 'reintroduced' category, hence the overall figures for the number of parks and sanctuaries in the latter category may swell. In addition, there is a likelihood of past introductions and reintroductions not having been reported, since records of those may not be available at the park or sanctuary.

#### **IV:2:21 Management Practices Pertaining to Forest Fires, Floods, Droughts and Water Pollution (No table)**

**Forest Fires:** 12 (32%) of the 37 national parks responding and 38 (23%) of the 165 sanctuaries responding reported the existence of fire lines, while 8 (21%) and 22 (13%) respectively reported the existence of other fire-fighting measures (See also Table II:2.1). As discussed earlier, 53% of the parks and 39% of the sanctuaries responding reported the incidence of forest fires, which gives some idea of the shortage of proper anti-fire facilities. However, these figures are not strictly comparable, since some parks and sanctuaries which reported the existence of fire lines had had no incidence of fire.

**Floods:** Of the 2 national parks and 14 sanctuaries reporting floods from among the areas responding, 1 (50%) and 5 (36%) respectively reported taking any flood control measures (See also Table II:2.2). These measures included creation of embankments, strengthening of bunds, provision of better drainage, etc.

**Droughts:** Of the 4 national parks and 28 sanctuaries reporting the incidence of drought from among those responding, all 4 national parks and 16 (57%) sanctuaries had taken some remedial measures (See also Table II:2.3). These measures included creation of artificial water points, digging of wells, etc.

**Water Pollution:** Of the 5 national parks and 20 sanctuaries reporting incidence of water pollution from among those responding, 3 (60%) and 8 (40%) respectively had taken some remedial measures (see also Table II:2.4). Measures ranged from lodging of protest with the relevant authorities to chemical treatment.

### *Limitations of the Data*

Whereas in some cases roads have been reported as fire lines, in others they have not. In the case of floods and droughts, and, to an extent, of fires, the absence of 'control measures' does not necessarily imply poor management, since these phenomenon may be seen to be a part of the natural cycles in some parks and sanctuaries. Thus for instance floods are believed to be a 'normal' phenomenon in Dudhwa National Park (U P), something which is well within the capacity of the ecosystem and its components to tolerate. It must however be pointed out that even where such conscious decisions on non-interference in natural processes have been taken, they are rarely based on a scientific study, as is obvious from the data obtained on research and monitoring done in national parks and sanctuaries (see Tables IV:2.8 and IV:2.9).

## IV:3 MANAGEMENT FACILITIES AND PERSONNEL

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For parks and sanctuaries to be properly managed there must be, as a minimum, trained staff in adequate numbers supported by appropriate equipment and facilities. This includes staff, equipment and facilities for carrying out the required research and monitoring.

The association of non-governmental agencies and individuals can provide valuable support to park managers and supplement the management efforts.

Data are presented below on some of these aspects: the existence of staff (section IV:3.1), including veterinarians (section IV:3.7); the availability of equipment (section IV:3.4), research facilities (section IV:3.5), and facilities for quarantine (section IV:3.6); the association of honorary wildlife wardens (section IV:3.2) and of non-governmental organisations or individuals (section IV:3.3).

### IV:3.1 Personnel

There is a heavy density of human population (see Table III:1.1) and a high frequency and intensity of various types of human activities (see for instance Tables III:1.2, III:1.3, III:1.5, III:1.7a, III:2.1) in and around most parks and sanctuaries in India. Their protection, therefore, requires intensive management by properly trained staff.

The extended database was used to get an idea of the number of staff stationed in parks and sanctuaries. The number of areas which have at least a part of the staff trained in wildlife management was also obtained. Table IV:3.1 lists these data for each national park and sanctuary which reported the existence of staff. *The data show that 45 (90%) of the 50 parks and 171 (87%) of the 196 sanctuaries responding have staff positioned in or for them.*

The number of staff members varies considerably from area to area. Since it would be more meaningful to compare these numbers with the amount of area they are supposed to look after, the density of staff was worked out for each

park and sanctuary. The names of protected areas having a staff density of 0.01 per ha and above, along with the range of densities, is given below:

N/S	Area (ha)	Total Staff	Staff Density (per ha)
ORI/S/NAN*	426.00	102	0.24
MAH/N/NAW*	133.88	32	0.24
MP/S/PAN	245.84	56	0.23
MAH/S/BOR	104.32	23	0.22
TN/S/VED	29.52	5	0.17
KAR/S/RAN	26.70	2	0.07
HAR/S/SUL	117.37	5	0.04
GOA/S/BON*	800.00	33	0.04
MAH/S/DEU*	217.31	7	0.03
MAH/S/KAR*	448.00	13	0.03
TN/N/GUI	270.57	7	0.03
WB/S/BAL	202.00	5	0.02
MEG/S/SIJ	518.00	12	0.02
HP/S/REN*	407.53	8	0.02
CHA/S/SUK*	2542.00	48	0.02
J&K/S/JAS	912.80	8	0.01
MAN/N/KEI	4000.00	24	0.01
MAH/S/TAN	21675.00	117	0.01
MAH/S/RAD	1361.05	10	0.01
MAH/S/NAG	15281.00	104	0.01
GUJ/S/KHI	604.86	5	0.01
RAJ/N/KEO	2873.00	38	0.01
KAR/S/ADI	84.44	1	0.01
WB/S/JAL*	11562.72	71	0.01
UP/S/NAW*	224.60	3	0.01
SIK/S/FAM	1500.00	10	0.01
GUJ/S/HIN	654.07	5	0.01

(\*These parks/sanctuaries reported the existence of zoos or animal enclosures within their boundaries; such enclosures would usually have a greater concentration of staff than would wilderness areas.)

The data further show that of the 45 parks reporting existence of staff, 30 (67%) had at least one staff member trained in wildlife. Corresponding figures for sanctuaries were 61 (36%) out of 171.

#### *Limitations of the Data*

For some areas, like a few of the parks and sanctuaries in Andaman & Nicobar Islands which are uninhabited by humans and difficult to get to without government assistance, there might be no good purpose served by posting personnel. In fact, in some cases the stationing of staff at such parks and sanctuaries might be undesirable as, even if the staff are well disciplined, their stay in the area would cause at least some ecological disturbance. Protection to the area could perhaps be best afforded by regular patrolling from nearby staff posts.

It is not always obvious whether the personnel shown as posted in parks or sanctuaries all reside in or around these areas and are exclusively meant for these parks or sanctuaries. In some cases forest officers posted in forest ranges or

divisions within which the park or sanctuary is situated, have additional responsibility of looking after these parks or sanctuaries and are thus shown as posted there.

#### IV:3.2 Honorary Wildlife Wardens

The scheme of having honorary wildlife wardens has been considered one way of involving people in the management of wildlife. Guidelines issued by the Department of Environment, Government of India, state:

People's participation and support is crucial for nature and wildlife conservation. One of the important ways of enlisting such support is by involving the community leaders and other persons of standing, who have the interest as well as the capacity to render assistance for this cause. Such assistance can be very useful in control over poaching and clandestine trade in wild animals or their articles, identification of relatively less known wildlife refuges needing protection, carrying the message of conservation to the people living in and around the sanctuaries and national parks and related matters. This objective can be accomplished if really suitable public-men are identified and appointed Honorary Wildlife Wardens, with their responsibilities, duties and powers clearly defined. (Department of Environment, 1982)

These Honorary Wildlife Wardens are given a legal status under Section 4 (1) (c) of the Wild Life (Protection) Act, and are appointed for a period of 1 year, their term being renewable for a period of 2-3 years at a time.

A question was asked about the existence of Honorary Wildlife Wardens in protected areas. *Of the 40 national parks and 167 sanctuaries responding, 19 (48%) and 53 (32%) respectively reported the presence of honorary wildlife wardens who were "active" in or around them.*

#### IV:3.3 Association of NGOs

The involvement of people and people's organisations in wildlife management has been recognised as crucial to the protection of wildlife areas. The National Wildlife Action Plan, drawn up by the Government of India, repeatedly stresses this point:

The involvement of Non-Government Organisations is of great importance to the total conservation effort of the country and there is an urgent need to define the role of such organisations and identify particular ways in which they can be of assistance. (Department of Environment, undated)

There has also been a task force, set up by the Indian Board for Wildlife, to report on ways and means of eliciting public support for wildlife conservation. (Indian Board for Wildlife, 1983)

Unfortunately, there does not seem to be much evidence of association of NGOs with parks and sanctuaries. *Of the 47 national parks and 198 sanctuaries responding, only 8 (17%) and 23 (12%) respectively reported association of NGOs.*

##### *Limitations of the Data*

The type of association that NGOs have varies from area to area. In some cases there is regular monitoring of the fauna and flora by NGOs, in other cases association means occasional and casual visits. On the other hand, this question refers only to formally associated NGOs, thus possibly leaving out several

NGOs who may at informal levels be involved with various parks and sanctuaries.

#### IV:3.4 Equipment

The ability of the staff to optimally manage a protected area is significantly enhanced by the availability of appropriate equipment. In fact, investment in equipment can not only reduce the human-power required, by making each individual more effective, but also reduce reaction time and allow for the anticipation and consequent prevention of many undesirable activities and occurrences.

*Nationwide, of the 40 national parks and 159 sanctuaries responding, 27 parks (68%) and 79 sanctuaries (50%) reported the existence of one or more kinds of equipment.*

Of the 27 kinds of equipment reported overall, the most common are binoculars and rifles or guns. The former were reported from 26 national parks (65% of those responding) and 52 sanctuaries (33% of those responding), and the latter from 16 parks (40%) and 39 sanctuaries (25%). Most of the other kinds of equipment were reported from less than 10 national parks or less than 10 sanctuaries. Only one area reported the presence of ten kinds of equipment: Simlipal National Park and Sanctuary of Orissa.

Other kinds of equipment mentioned are fibre-glass boats, motor boats, outboard engines, dinghies, 16mm and slide projectors, microscopes, jeeps, cameras, bird nets, trap cages, motorcycles, tape recorders, searchlights and torches, cycles, syringe projection pistols, and fire-fighting equipment sets. Barring 16mm projectors and cameras, all of these were reported from less than 10 parks and sanctuaries.

#### *Limitations of the Data*

It is important to note that figures regarding existence of equipment do not reflect their appropriateness or adequacy. In other words, to say that 68% of the national parks and 50% of the sanctuaries responding have equipment is not to say that even in these areas the equipment available is adequate for the proper management of the area. On the other hand it is significant that 32% of the parks and exactly half the sanctuaries responding have no equipment at all.

Another factor that this data does not reflect is the condition of the existing equipment, i.e. whether the wireless sets, binoculars, rifles, etc. are in working order or not. Field visits to many areas have revealed that maintenance of the equipment is usually a problem. Also, though information was sought regarding equipment physically located at the park or sanctuary and exclusively for use there, at least in some cases field verification has shown that even equipment with the wildlife wing at the state headquarters has been shown as being available at one or more of the parks or sanctuaries.

On the other hand, while in general the park or sanctuary authorities responding to this question seem to have given a complete list of equipment

available, there may be cases where some equipment may have been missed out. This has been found to occur in the case of vehicles available, since the question did not specifically ask for vehicles. Also, only some parks and sanctuaries filled up anything in the category of 'other equipment', though many others probably had miscellaneous equipment not covered under any of the listed items. This is so, for instance, in the case of torches and cycles, both of which have been reported from only one sanctuary, though they obviously exist in many more!

#### IV:3.5 Research Facilities

National parks and sanctuaries are amongst the richest areas remaining in India for studying natural ecosystems, and the behaviour and interaction between different elements of the natural environment. Research in such areas can add to the body of human knowledge and generate information useful for the management of the area (for details on research activities please see section IV:2.8 and IV:2.9). It is, therefore, very important to encourage such research.

One way of encouraging research in parks and sanctuaries is to make available equipment and vehicles, and facilities like cheap accommodation to researchers, both governmental and private.

*Of the 41 parks and 174 sanctuaries responding 10 (24%) and 15 (9%) respectively reported the existence of special facilities and/or equipment for researchers.* For a detailed list of equipment available, for research and other purposes, see Table IV:3.4.

#### IV:3.6 Quarantine Facilities

As a device to prevent and control livestock-caused epidemics among wild animals, quarantine is very useful. Facilities such as livestock impounding pens or stockades are necessary for this. Data were therefore sought on the availability of quarantine facilities.

*Of the 46 national parks and 194 sanctuaries responding, only 3 (7%) and 10 (5%) respectively reported the existence of quarantine facilities.* In fact, only 5 states: Andhra Pradesh, Arunachal Pradesh, Karnataka, Uttar Pradesh and West Bengal, reported the existence of these facilities in any of their parks or sanctuaries.

#### IV:3.7 Availability of Veterinarian

To meet emergencies and to take care of general problems relating to the health of wild animals, the presence of a vet within a park or sanctuary is very useful. *Of the 45 national parks and 199 sanctuaries responding, only 7 (16%) and 12 (6%) respectively reported the presence of vets.*

*Limitations of the Data*

Information was not collected on the field of expertise of the veterinarian staff stationed at these 7 parks and 12 sanctuaries, or on whether these vets have specialised on wild animals.

## V. Conclusions and Recommendations

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For the development and maintenance of a viable wildlife protected area network in the country, various steps are needed.

- Identification of the areas to be declared as national parks or sanctuaries, on the basis of their ecological value and their administrative viability.
- Formulation and implementation of management plans, based on the requirements and objectives of each protected area and its surrounds.
- Commitment of adequate financial and managerial inputs to make the management plan workable.
- Initiation and completion of the legal procedures required to constitute these areas into national parks and sanctuaries.
- Monitoring of the protected areas to help progressively improve their management, and adapt management practices to new or changing requirements.

In conclusion, we give below our major findings regarding the current status of activity and achievement relevant to each of these steps. We also offer some recommendations, based on our data.

### 1. IDENTIFICATION OF AREAS

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#### 1.1 The Formulation of Specific Categories of Protected Areas with Specific Criteria for their Creation and Management.

At present, the Wild Life (Protection) Act of 1972 mentions four types of protected areas which have legal status and legally enforceable provisions, namely 'national parks', 'sanctuaries', 'game reserves' and 'closed areas'. Of these, only national parks and sanctuaries have detailed legal provisions.

Neither on the basis of the Wild Life (Protection) Act, nor by usage and convention, has a uniform set of criteria been defined and applied throughout the country for classification of a specific area as a national park or sanctuary. As a result, sometimes an area of purely local importance may be classified as a national park, while an area which perhaps contains highly endangered species may be classified as a sanctuary even though under the Act the former would get greater protection. Certain areas, which are no more than large zoos, are today classified as national parks or sanctuaries. There are also classifications such as 'biosphere reserve', and 'tiger reserve' which are being increasingly used to focus on certain management objectives, but which have no corresponding legal status.

Areas may be set aside and afforded legal protection for a wide variety of reasons : as representative ecosystems; as important habitats of threatened,

rare or endangered species; for their genetic richness, aesthetic value, ecological importance; or for their research, educational or recreational potential. The IUCN has as many as 10 classifications, from 'scientific/strict nature reserves' prohibiting all human interventions except research, to 'managed resource areas' where a multiplicity of uses are envisaged.

It is recommended that the Government of India, in consultation with state governments, non-governmental organisations and individuals, evolve a protected areas classification which enunciates the different categories of areas, the specific management objectives and legal status for each category, and a uniform set of criteria to be applied throughout the country for placing areas within each category.

### 1.2 The Formulation of Processes for Identifying Areas to be Protected

We have not, in this report, looked at the processes involved in identifying areas which should be made into national parks or sanctuaries. The recently published *Planning a Wildlife Protected Area Network in India* (Rodgers and Panwar, 1988) goes a long way in developing a system for identifying new areas that need to be protected. However, Rodgers and Panwar's report looks almost exclusively at ecological values while recommending the creation of additional protected areas, or the extension of existing ones. Though this is not a failing of the report, for that is all it intended to do, in our opinion the social pressures and disturbances affecting a protected area are also relevant factors to be considered while identifying areas to be made into national parks or sanctuaries.

### 1.3 The Formulation of a Regional Land Use Plan

We feel that it is not possible to properly identify areas for protection without reference to a land use plan for the region encompassing such areas. The appropriate growth and maintenance of a protected area network requires long-term strategies to divert the biotic pressures that most such areas are increasingly facing. Such strategies can only be developed in the overall context of a land use plan.

It is therefore recommended that the Government of India, in consultation with state governments and with people's representatives, urgently draw up a broad conservation-based land use plan for the country involving:

- The identification of national and regional zones as independent units for planning, based on the distribution of natural resources. A river basin, for instance, could become such a unit since the ecological processes in it are intimately intertwined.
- A determination of the optimal land use pattern for each zone and region, demarcating those areas that need to be protected as national parks and

sanctuaries, setting them apart from areas meant for agriculture, urban expansion, mining, industry, and other activities.

## 2. FORMULATION AND IMPLEMENTATION OF A MANAGEMENT PLAN

### 2.1 Planning

(a) A management plan is a prerequisite for adequate management of a protected area. Only 43% of the national parks and 28% of the sanctuaries responding reported having management plans (see section IV:1.1), and many of these were no more than a brief description of the area and a budget. Quite a few of these management plans had also never been approved by the state government.

It is recommended that the Government of India set up a working group, with adequate representation from the states, to make an assessment of the various problems in the preparation and approval of management plans. This group should be asked to:

- Draw up detailed guidelines for the formulation of management plans, specifying among other things the objectives of the area; the management strategies required; and the staffing norms based on the size of the area, its objectives, its biogeographic characteristics, and the pressures and disturbances it is subjected to. The working group might like to refer to the report of an earlier committee set up for formulating such guidelines: *Guidelines for the Preparation of Management Plans for Sanctuaries and National Parks*, Government of India, undated.
- Recommend steps which could facilitate the preparation and approval of management plans.
- Examine the desirability of training management planners.

(b) A detailed management plan for a park or sanctuary should include an appreciation of the pressures from within as well as the surrounding areas. Such a plan should be based on a survey of both the natural resources, as well as of the socio-economic profile of the human population, in and around the protected area. It should therefore contain realistic and workable schemes for conserving and using the natural resources, including the diversion of human pressures from the protected areas, if necessary.

For example, where an area is considered ecologically very valuable but has significant human pressures on it, funds must be committed in advance of setting up the park or sanctuary to develop alternatives for the local people. Where such alternatives have a long gestation period, they must be initiated before the final notification of the area is completed. If access to an area is to be denied to the local people for 'national interest', then the 'nation' should adequately compensate them and find alternatives for them.

The different types of biotic pressures that our parks and sanctuaries are facing can be ordered in terms of their socio-economic justifiability and the

difficulties anticipated in their control. One way of ordering could be the following:

Type	Activities	Justifiability	Ease of Control
A	(i) Environmentally destructive tourism (including inappropriate group treks)	Low	High
	(ii) Environmentally destructive research (e.g., large-scale collections)	Low	High
B	(i) Use by government agencies for irrigation, hydro-electricity, mining, roads, timber extraction, extraction of other forest produce, habitation, etc.	Medium	High
	(ii) The above activities by licensed contractors	Low	Medium
C	(i) Illegal grazing, poaching, felling, collection of other forest produce, etc. by local individuals	Medium	Medium
	(ii) Similar activities by outsiders	Low	Medium
D	(i) Traditional habitation, cultivation, grazing, cutting and collection of timber and other forest produce, religious rituals, fishing, trapping, etc. by local communities, whether legal or illegal	High	Low

It is recommended that the above pressures be dealt with in the following ways.

(i) For category A it is necessary to strengthen the management of the parks and sanctuaries and either to ban these activities or closely monitor them to see that negative impacts are kept to the minimum. It must be stressed that controlled and appropriate research, and tourism, can in fact contribute significantly to conservation efforts. What is urgently needed is a study of the carrying capacity of each protected area. Based on this, park managers should determine what sort of research activities would be permitted, and evolve detailed tourism plans which specify the quantum, type, and distribution of

tourism which can safely be allowed. This would include the creation of special tourist zones, the delineation of areas where tourism would be completely prohibited, and the type of facilities needed for tourists which would also be in consonance with wildlife protection values.

(ii) For category B it is necessary to evaluate the ecological impact of these various activities and to ensure that, as far as possible, such activities are phased out from parks and sanctuaries and alternate sites are found. In those rare cases where it is imperative to allow such activities, the greatest care would have to be taken to minimise their ecological impact.

**It is further recommended that the Government of India urgently constitute, in consultation with the state governments, a high level committee to closely examine the existing activities in parks and sanctuaries by government agencies and their licensees, and to rationalise them.**

The Chief Secretaries of states should be special invitees to the meetings relevant to their respective states. This committee should also prescribe detailed procedures for screening proposed activities in protected areas. It has been our experience that state wildlife wings are often overruled by the state government in their objections to ecologically disturbing activities within protected areas. Whatever administrative and legal safeguards are designed should take this into consideration. The possibility of covering ecologically disturbing activities in protected areas under the Forest Conservation Act of 1980 should also be seriously examined.

(iii) For categories C and D it seems necessary to evaluate properly the reasons why the concerned persons indulge in these activities. Where there are no justifiable reasons, like in the case of outsiders who come in for illegal hunting, it is necessary to strengthen the implementation of the relevant laws. However in cases where the circumstances are justifiable, as in the case of fuelwood collection for domestic use by local villagers, there is a necessity of finding alternatives. This can be best done by properly planning out the utilisation of the natural resources in the region, as has been suggested above. The idea of demarcating buffer zones and developing them for use by local communities has still to be fully explored in India; it needs to be urgently worked on.

(c) These management plans should, of course, also include an assessment of the staff and funds required, the type of skills that the staff should possess, their job requirements and the equipment and facilities that they would need. Periodic reviews and revisions of the plans would also be necessary.

It is obvious, but nevertheless needs to be stressed, that such a management plan would need to be worked out by a team which is inter-disciplinary, which could adequately assess the ecological and socio-economic characteristics and requirements of the area.

**It is recommended that such teams be set up by state governments to develop management plans for each proposed protected area, as well as for each existing protected area for which management plans do not already exist or are inadequate by the above standards.**

(d) Approximately a fourth of the areas responding reported special management problems due to the existence of inter-state boundaries or other vulnerable areas (see section III:1.10). One of the major problems is the inability of the wildlife personnel to pursue poachers across state boundaries.

**It is recommended that states having parks or sanctuaries on state boundaries should reach agreements with their neighbours allowing them authority across the border, similar to that given to the state police forces.**

(e) A management plan should also cover activities related to park interpretation, tourist education and extension education for the local communities. Past and present efforts in this direction have been generally inadequate in protected areas in India (see section IV:2.11, and sections IV:2.13 to IV:2.16). Such efforts are necessary to re-orient the casual or even destructive tourist towards helping in conservation, and to develop a sense of pride rather than resentment and hostility among local people.

This is an area where non-governmental organisations and individuals can play a very significant and effective role in supplementing the efforts of wildlife personnel.

**It is recommended that education and interpretation programmes be greatly stepped up in each park and sanctuary which has tourist pressure and/or local human population. It would be important to emphasise not only the intrinsic value of the area but its relevance to the local population in terms of combating droughts, floods, landslides and other natural problems which affect their own survival and well being.**

**Also recommended is a policy which gives local people the opportunity to earn a livelihood in these education and interpretation programmes, e.g. as trained guides, like the rickshaw pullers at Keoladeo Ghana National Park who have gradually become experts at bird identification.**

Reference needs to be made here to the *National Wildlife Action Plan* of the Government of India (Department of Environment, undated), and to a report of the Indian Board for Wildlife, *Eliciting Public Support for Wildlife Conservation: A Report of the Task Force* (Indian Board for Wildlife, 1983). Both these documents give very valuable suggestions for involving the people in wildlife conservation, and what is needed now is to develop and add to these suggestions and to start implementing them.

(f) A management plan must also include clear and just procedures for compensating the local community for injury or damage. Incidents of human and livestock injury or death, and of crop damage caused by wild animals inside or around parks and sanctuaries, have become quite common in India. Considerable resentment has been generated because villagers are denied the right to injure or kill the animal causing damage to their livestock or crops. This resentment has been greatly exacerbated when compensation is not paid, as seems to be the policy or practice in the case of many of our parks and sanctuaries (see sections IV:2.3 and IV:2.4).

**It is recommended that the policy of compensating the loss suffered by a local person in or around a protected area be extended to the whole of India, and that the range of rates payable be uniformly fixed for the whole country, subject to minor modifications relating to local conditions. Where doubts exist on whether damage or injury has been caused by wild animals, the benefit of doubt should be given to the owner of the livestock affected.**

## 2.2 Research

Most of this planning is possible only if adequate information is available regarding the relevant biological and socio-economic parameters. Given the current paucity of data, we feel that immediate steps should be taken to commission research on various aspects concerning the setting up and management of our protected areas. The research on biological parameters needs to be taken up by institutions and individuals having expertise in the life sciences. Socio-economic research should accordingly involve social scientists. The two need to work together to obtain a complete picture. NGOs, independent institutions and individuals should gear themselves up for this work, design multi-disciplinary studies, and approach the government for the requisite funding; conversely, the government must approach and fund organisations and individuals.

We give below the current status and some specific recommendations regarding research relevant to national parks and sanctuaries.

(a) Only 42% of the national parks and 23% of sanctuaries responding reported the existence of some research activities (see section IV:2.8). Understandably, therefore, there is almost a total lack of information available with many of the parks and sanctuaries on several biological and managerial parameters.

At least three types of research studies need to be urgently taken up.

- Studies aimed at developing the geographical and ecological profile of each of the protected areas. This would involve developing a listing of flora and fauna, a recording of other bio-geographical features including climate and water resources, and building up of maps for the area.
- Studies recording the incidence, frequency, distribution and cause of various natural and human-caused occurrences in the protected areas. Fires, droughts,

epidemics, floods, and pollution are some among the many such issues that need to be looked at in detail.

- Studies to determine the impact that various activities and occurrences in the national parks and sanctuaries have on the ecosystem.

(b) The existing facilities available for undertaking these studies are quite inadequate. Only 24% of the national parks and 9% of the sanctuaries indicated the availability of research facilities. (see section IV:3.5)

At a minimum, it is recommended that each park and sanctuary be provided at least the basic equipment to collect regular climatic information. The question of building up further research facilities in some selected parks and sanctuaries must also be urgently examined, and priority must be given to the appointment of research officers to major parks and sanctuaries.

It is further recommended that the Government of India along with the state governments urgently constitute a research advisory committee and earmark funds for sponsoring research into some of the more important parameters relevant to the setting up and management of protected areas.

The committee should be given the task of identifying priority research areas, of locating individuals and institutions interested and able to do the required research, and of periodically reviewing the state of research.

### 3. COMMITMENT OF RESOURCES

As many as 32% of the national parks and 50% of the sanctuaries in India reported the absence of equipment (see section IV:3.4); and in many other cases the available equipment was inadequate or inappropriate. Closely related to the above point is the shortage of management aids like maps. While 88% of the national parks and 76% of the sanctuaries reported the availability of maps (see section IV:2.12), it was also seen that in many cases these were merely outline maps filled in with the barest of details. Even Survey of India toposheets were not available in many places. Only 57% of the national parks and 21% of the sanctuaries responding reported the existence of literature on the protected area (see section IV:2.11). The availability of adequate numbers of staff was also a problem (see section IV:3.1).

All this is not surprising considering the very low quantum of funds made available for the management of national parks and sanctuaries. On the basis of the responses received (from 17 states and union territories), it appears that in 1982-83 the average expenditure on parks and sanctuaries in these states was a mere 1.46% of the forest department budget, and in 1983-84 it increased marginally to 1.54%. (see annexure 6 for details)

It is recommended that the allocation of funds for wildlife management in a state be a realistic reflection of the funds required by the state's

protected areas to implement their management plans, and to procure the equipment required by them for the purpose. The Government of India should also review the central assistance schemes in order to help achieve this objective.

#### 4. INITIATION AND COMPLETION OF LEGAL PROCEDURES

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(a) Considering that only 40% of the national parks and 8% of the sanctuaries responding have completed the legal procedures prescribed under the Wild Life (Protection) Act (see section I:1), and that as many as 68% of the sanctuaries responding have reported the existence of some rights which need to be examined and settled (see section III:1.2), there appears an urgent need to determine the reasons behind the non-completion of the legal procedures.

It must be stressed that this delay in completing procedures considerably hampers the proper protection and management of a protected area; it must also be reiterated that the responsibility for determining, acquiring, extinguishing, or otherwise dealing with rights in parks and sanctuaries lies with the District Collector or an officer appointed by the state government for the purpose. Delays in completion of legal procedures appear primarily to be taking place at this stage, the reasons for which need to be examined.

It is recommended that the Government of India urgently constitute a working group which can quickly and in detail look at the reasons behind the delays in completing the legal procedures for protected areas, and recommend the measures required to solve the problem. Representatives from state governments may be included in this working group.

It is further recommended that the working group not only critically examine the existing laws and procedures pertaining to the notification of parks and sanctuaries, the identification of rights and their settlement, but also, through a sample study, understand the problems in the field. This group should also be asked to evolve methods of fixing responsibility for delays and perhaps of building up a mandatory time schedule for the various prescribed steps and procedures, something that the Wild Life (Protection) Act does not contain.

It is also recommended that this group examine the question whether some parks and sanctuaries have been set up in such locations that the prevailing human pressures do not allow a proper completion of prescribed procedures, and if so, what remedial measures in terms of pre-conditions for setting up protected areas should be recommended.

(b) Considering that the Forest Act of 1927 prescribes procedures for setting up a reserve forest which are identical in their relevant portions to those prescribed in the Wild Life (Protection) Act for setting up a national park or sanctuary,

it is recommended that the Wild Life (Protection) Act be modified to exempt those areas that were reserve forests prior to their declaration as sanctuaries or parks, and have no rights or leases existing within, from having to go through the procedures relating to the identification and settlement of rights (Sections 19 to 26 of the Act; see Annexure 2).

(c) Considering the delay in issuing the final notification for national parks (see section I:1), as specified in Section 35(4) of the Wild Life (Protection) Act, and the subsequent legal embarrassment in controlling ecologically destructive activities in areas for which the intention has been declared to constitute them into national parks,

it is recommended that the Act be suitably amended to give 'intended' national parks the legal protection accorded to sanctuaries till the final notification has been done.

(d) Section 55 of the Wild Life (Protection) Act states that 'No court shall take cognizance of any offence against this Act except on the complaint of the Chief Wild Life Warden or such other officer as the State Government may authorise in this behalf.' This denies private citizens *locus standi*. Considering the need to constantly monitor our protected areas and the Government's avowed policy to involve NGOs and NGIs in wildlife conservation,

it is recommended that Section 55 be deleted and full access be given to each citizen to avail of the Act.

## 5. MONITORING

Protected areas and the management activities therein need to be continuously monitored. It is also apparent that at present, given the inadequacy of staff, facilities, and training, the government departments and agencies concerned with wildlife management are not capable of doing this monitoring entirely by themselves. Only 20% of the national parks, and 11% of the sanctuaries responding reported the existence of monitoring programmes (see section IV:2.9).

It is therefore recommended that non-governmental individuals and organisations be involved in monitoring. NGOs and NGIs would be especially effective in monitoring programmes which aim at reducing the local conflicts between wildlife preservation and human welfare, where such conflicts exist.

It would of course be necessary for the government structure to be more open than it has some times been in the past, to the involvement of people and organisations outside of it. This would include, for instance, giving easier access to information and documents available with the government.

In this connection it is encouraging to note that the Government of India has recently set up a committee to do some of the monitoring mentioned above (the Protected Area Network Monitoring Committee, set up in September 1988, by the Government of India).

# ANNEXURES



## 1a. List of National Parks and Sanctuaries Referred to in the Report\*

Code	Name	Code	Name
A&N/N/MID	MIDDLE BUTTON ISLAND NATIONAL PARK	GUJ/S/KHI	KHIJADIYA SANCTUARY
A&N/N/MOU	MOUNT HARRIET NATIONAL PARK	GUJ/S/MAR	MARINE SANCTUARY
A&N/N/NOR	NORTH BUTTON ISLAND NATIONAL PARK	GUJ/S/NAL	NALSAROVAR SANCTUARY
A&N/N/SAD	SADDLE PEAK NATIONAL PARK	GUJ/S/NAR	NARAYAN SAROVAR SANCTUARY
A&N/N/SOU	SOUTH BUTTON ISLAND NATIONAL PARK	GUJ/S/RAT	RATANMAHAL SANCTUARY
A&N/S/BAR	BARREN ISLAND SANCTUARY		
A&N/S/CRO	CROCODILE (LOHABARRACK) SANCTUARY	HAR/S/SUL	SULTANPUR SANCTUARY
A&N/S/NAR	NARCONDUM SANCTUARY		
A&N/S/NOR	NORTH REEF ISLAND SANCTUARY	HP/N/GRE	GREAT HIMALAYAN NATIONAL PARK
A&N/S/SOU	SOUTH SENTINEL SANCTUARY	/S/BAN	BANDLI SANCTUARY
		HP/S/CHA	CHAIL SANCTUARY
AP/S/COR	CORINGA SANCTUARY	HP/S/DARA	DARANGHATI (I & II) SANCTUARY
AP/S/ETU	ETURNAGARAM SANCTUARY	HP/S/DARL	DARLAGHAT SANCTUARY
AP/S/KAW	KAWAL SANCTUARY	HP/S/GAM	GAMGUL SLAHBEHI SANCTUARY
AP/S/KIN	KINNERSANI SANCTUARY	HP/S/GOB	GOBIND SAGAR SANCTUARY
AP/S/KOL	KOLLERU SANCTUARY	HP/S/KAI	KAIS SANCTUARY
AP/S/MAN	MANJIRA SANCTUARY	HP/S/KAL	KALATOP KHAIJIAR SANCTUARY
AP/S/NAG	NAGARJUNASAGAR SRISAILAM SANCTUARY	HP/S/KAN	KANAWAR SANCTUARY
AP/S/NEE	NEELAPATTU SANCTUARY	HP/S/KHO	KHOKHAN SANCTUARY
AP/S/PAK	PAKHAL SANCTUARY	HP/S/KUG	KUGTI SANCTUARY
AP/S/PAP	PAPIKONDA SANCTUARY	HP/S/LIP	LIPPA ASRANG SANCTUARY
AP/S/POC	POCHARAM SANCTUARY	HP/S/MAJ	MAJATHAL SANCTUARY
AP/S/PRA	PRANHITA SANCTUARY	HP/S/MAN	MANALI SANCTUARY
AP/S/PUL	PULICAT SANCTUARY	HP/S/NAI	NAINA DEVI SANCTUARY
AP/S/SIW	SIWARAM SANCTUARY	HP/S/NAR	NARGU SANCTUARY
		HP/S/PON	PONG DAM SANCTUARY
ARU/N/NAM	NAMDAPHA NATIONAL PARK	HP/S/RAK	RAKCHHAM CHITKUL SANCTUARY
ARU/S/ITA	ITANAGAR SANCTUARY	HP/S/REN	RENUKA SANCTUARY
ARU/S/LAL	LALI SANCTUARY	HP/S/RUP	RUPI BHABA SANCTUARY
ARU/S/MEH	MEHAO SANCTUARY	HP/S/SEC	SECHU TUAN NALA SANCTUARY
ARU/S/PAK	PAKHUI SANCTUARY	HP/S/SHIK	SHIKARI DEVI SANCTUARY
		HP/S/SHIL	SHILLI SANCTUARY
BIH/S/BHI	BHIMBANDH SANCTUARY	HP/S/SHIM	SHIMLA WATER CATCHMENT AREA SANCTUARY
BIH/S/DAL	DALMA SANCTUARY		
BIH/S/GAU	GAUTAM BUDHA SANCTUARY	HP/S/SIM	SIMBALBARA SANCTUARY
BIH/S/HAZ	HAZARIBAGH SANCTUARY	HP/S/TAL	TALRA SANCTUARY
BIH/S/LAW	LAWALONG SANCTUARY	HP/S/TIR	TIRTHAN SANCTUARY
BIH/S/PAL	PALAMAU SANCTUARY #	HP/S/TUN	TUNDAH SANCTUARY
BIH/S/RAJ	RAJGIR SANCTUARY		
BIH/S/TOP	TOPCHANCHI SANCTUARY	J&K/N/DAC	DACHIGAM NATIONAL PARK
BIH/S/VAL	VALMIKI NAGAR SANCTUARY	J&K/N/KIS	KISHTWAR NATIONAL PARK
		J&K/S/JAS	JASROTA SANCTUARY
GOA/N/BHA	BHAGWAN MAHAVIR NATIONAL PARK	J&K/S/NAN	NANDINI SANCTUARY
GOA/S/BHA	BHAGWAN MAHAVIR SANCTUARY	J&K/S/RAM	RAMNAGAR SANCTUARY
GOA/S/BON	BONDLA SANCTUARY	J&K/S/SUR	SURINSAR MANSAR SANCTUARY
GOA/S/COT	COTIGAO SANCTUARY		
		KAR/N/BANN	BANNERGHATTA NATIONAL PARK
GUJ/N/BAN	BANSDA NATIONAL PARK	KAR/N/NAG	NAGARHOLE NATIONAL PARK
GUJ/N/GIR	GIR NATIONAL PARK	KAR/S/ADI	ADICHUNCHANAGIRI SANCTUARY
GUJ/N/MAR	MARINE NATIONAL PARK	KAR/S/BHA	BHADRA SANCTUARY
GUJ/N/VEL	VELAVADAR NATIONAL PARK	KAR/S/BIL	BILIGIRI RANGASWAMY SANCTUARY
GUJ/S/BAR	BARDA SANCTUARY	KAR/S/BLA	BLACK BUCK (RANEBENNUR) SANCTUARY
GUJ/S/DHR	DHRANGADHRA SANCTUARY		
GUJ/S/DUM	DUMKHAL SANCTUARY	KAR/S/BRA	BRAHMAGIRI SANCTUARY
GUJ/S/GIR	GIR SANCTUARY	KAR/S/DAN	DANDELI SANCTUARY
GUJ/S/HIN	HINGOLGADH SANCTUARY	KAR/S/GHA	GHATAPRABHA SANCTUARY
GUJ/S/JES	JESSORE SANCTUARY	KAR/S/MEL	MELIKOTA TEMPLE SANCTUARY

<i>Code</i>	<i>Name</i>	<i>Code</i>	<i>Name</i>
KAR/S/MOO	MOOKAMBIKA SANCTUARY	MP/S/KHE	KHEONI SANCTUARY
KAR/S/NUG	NUGU SANCTUARY	MP/S/NAR	NARSINGGARH SANCTUARY
KAR/S/RAN	RANGANATHITTU SANCTUARY	MP/S/NAT	NATIONAL CHAMBAL SANCTUARY
KAR/S/SHA	SHARAVATHI VALLEY SANCTUARY	MP/S/NAU	NAURADEHI SANCTUARY
KAR/S/SHE	SHETTYHALLY SANCTUARY	MP/S/PAC	PACHMARHI SANCTUARY
KAR/S/SOM	SOMESWARA SANCTUARY	MP/S/PAL	PALPUR KUND SANCTUARY
KER/N/ERA	ERAVIKULAM NATIONAL PARK	MP/S/PAM	PAMED SANCTUARY
KER/N/PER	PERIYAR NATIONAL PARK	MP/S/PAN	PANPATHA SANCTUARY
KER/N/SIL	SILENT VALLEY NATIONAL PARK	MP/S/PEN	PENCH SANCTUARY
KER/S/ARA	ARALAM SANCTUARY	MP/S/PHE	PHEN SANCTUARY
KER/S/CHIM	CHIMONY SANCTUARY	MP/S/RAT	RATAPANI SANCTUARY
KER/S/CHIN	CHINNAR SANCTUARY	MP/S/SAI	SAILANA SANCTUARY
KER/S/IDU	IDUKKI SANCTUARY	MP/S/SAN	SANJAY (DUBRI) SANCTUARY
KER/S/NEY	NEYYAR SANCTUARY	MP/S/SEM	SEMARLOT SANCTUARY
KER/S/PAR	PARAMBICULAM SANCTUARY	MP/S/SIN	SINGHORI SANCTUARY
KER/S/PEE	PEECHI VAZHANI SANCTUARY	MP/S/SIT	SITANADI SANCTUARY
KER/S/PEP	PEPPARA SANCTUARY	MP/S/SON	SON GHARIAL SANCTUARY
KER/S/SHE	SHENDURNEY SANCTUARY	MP/S/TAM	TAMOR PINGLA SANCTUARY
KER/S/THA	THATTEKAD SANCTUARY	MP/S/UDA	UDANTI SANCTUARY
KER/S/WYN	WYNAD SANCTUARY	NAG/S/INT	INTANKI SANCTUARY
MAH/N/NAW	NAWEGAON NATIONAL PARK	ORI/N/SIM	SIMLIPAL NATIONAL PARK
MAH/N/PEN	PENCH NATIONAL PARK	ORI/S/BAI	BAISIPALLI (MAHANADI) SANCTUARY
MAH/N/SAN	SANJAYGANDHI NATIONAL PARK	ORI/S/BHI	BHITTAR KANIKA SANCTUARY
MAH/N/TAD	TADOBA NATIONAL PARK	ORI/S/CHA	CHANDKA DAMPARA SANCTUARY
MAH/S/BOR	BOR SANCTUARY	ORI/S/HAD	HADGARH SANCTUARY
MAH/S/DEU	DEULGAON SANCTUARY	ORI/S/NAN	NANDANKANAN SANCTUARY
MAH/S/DHA	DHAKNA KOLKAZ SANCTUARY	ORI/S/SAT	SATKOSIA GORGE SANCTUARY
MAH/S/GRE	GREAT INDIAN BUSTARD SANCTUARY	ORI/S/SIM	SIMLIPAL SANCTUARY
MAH/S/KAR	KARNALA SANCTUARY	RAJ/N/DES	DESERT NATIONAL PARK
MAH/S/KIN	KINWAT SANCTUARY	RAJ/N/KEO	KEOLADEO NATIONAL PARK
MAH/S/NAG	NAGZIRA SANCTUARY	RAJ/N/RAN	RANTHAMBORE NATIONAL PARK
MAH/S/RAD	RADHANAGARI SANCTUARY	RAJ/N/SAR	SARISKA NATIONAL PARK
MAH/S/TAN	TANSA SANCTUARY	RAJ/S/BHE	BHENSRODGARH SANCTUARY
MAH/S/YAW	YAWAL SANCTUARY	RAJ/S/DAR	DARAH SANCTUARY
MAN/N/KEI	KEIBUL LAMJAO NATIONAL PARK	RAJ/S/JAI	JAISAMAND SANCTUARY
MEG/S/NON	NONGKHYLLEM SANCTUARY	RAJ/S/JAM	JAMVA-RAMGARH SANCTUARY
MEG/S/SIJ	SIJU SANCTUARY	RAJ/S/JAW	JAWAHAR SAGAR SANCTUARY
MP/N/BAN	BANDHAVGARH NATIONAL PARK	RAJ/S/KAI	KAILA DEVI SANCTUARY
MP/N/FOS	FOSSIL NATIONAL PARK	RAJ/S/KUM	KUMBHALGARH SANCTUARY
MP/N/IND	INDRAVATI NATIONAL PARK	RAJ/S/MOU	MOUNT ABU SANCTUARY
MP/N/KANG	KANGER GHATI NATIONAL PARK	RAJ/S/NAH	NAHARGARH SANCTUARY
MP/N/MAD	MADHAV NATIONAL PARK	RAJ/S/NAT	NATIONAL GHARIAL SANCTUARY
MP/N/PAN	PANNA NATIONAL PARK	RAJ/S/PHU	PHULWARI SANCTUARY
MP/N/PEN	PENCH NATIONAL PARK	RAJ/S/RAM	RAMGARH SANCTUARY
MP/N/SAN	SANJAY NATIONAL PARK	RAJ/S/SAR	SARISKA SANCTUARY
MP/N/SAT	SATPURA NATIONAL PARK	RAJ/S/SHE	SHERGARH SANCTUARY
MP/N/VAN	VAN VIHAR NATIONAL PARK	RAJ/S/SIT	SITA MATA SANCTUARY
MP/S/ACH	ACHANKMAR SANCTUARY	RAJ/S/TAL	TAL CHAPTER SANCTUARY
MP/S/BAD	BADALKHOL SANCTUARY	RAJ/S/TOD	TODGARH RAOLI SANCTUARY
MP/S/BAG	BAGDARA SANCTUARY	RAJ/S/VAN	VAN VIHAR SANCTUARY
MP/S/BAR	BARNAWAPARA SANCTUARY	SIK/N/KHA	KHANGCHENDZONGA NATIONAL PARK
MP/S/BHA	BHAIRAMGARH SANCTUARY	SIK/S/FAM	FAMBUNG LHO SANCTUARY
MP/S/BOR	BORI SANCTUARY	TN/N/GUI	GUINDY NATIONAL PARK
MP/S/GAN	GANDHI SAGAR SANCTUARY	TN/S/ANA	ANAMALAI SANCTUARY
MP/S/GHA	GHATIGAON-GREAT INDIAN BUSTARD SANCTUARY	TN/S/KAL	KALAKAD SANCTUARY
MP/S/GOM	GOMARDA SANCTUARY	TN/S/MUD	MUDUMALAI SANCTUARY
MP/S/KAR	KARERA-GREAT INDIAN BUSTARD SANCTUARY	TN/S/MUN	MUNDANTHURAI SANCTUARY
MP/S/KEN	KEN GHARIAL SANCTUARY	TN/S/NIL	NILGIRI TAHR SANCTUARY
MP/S/KHA	KHARMORE SANCTUARY	TN/S/POI	POINT CALMERE SANCTUARY
		TN/S/VED	VEDANTHANGAL SANCTUARY

<i>Code</i>	<i>Name</i>	<i>Code</i>	<i>Name</i>
UP/N/COR	CORBETT NATIONAL PARK	UP/S/NAW	NAWABGANJ SANCTUARY
UP/N/DUD	DUDHWA NATIONAL PARK	UP/S/RAJ	RAJAJI SANCTUARY+
UP/N/NAN	NANDA DEVI NATIONAL PARK	UP/S/RAN	RANIPUR SANCTUARY
UP/N/VAL	VALLEY OF FLOWERS NATIONAL PARK		
UP/S/CHA	CHANDRAPRABHA SANCTUARY	WB/N/SUN	SUNDERBANS NATIONAL PARK
UP/S/CHI	CHILLA SANCTUARY +	WB/S/BAL	BALLAVPUR SANCTUARY
UP/S/GOV	GOVIND PASHUVIHAR SANCTUARY	WB/S/EET	BETHUADAHARI SANCTUARY
UP/S/KAI	KAIMUR SANCTUARY	WB/S/HAL	HALLIDAY SANCTUARY
UP/S/KAT	KATERNIAGHAT SANCTUARY	WB/S/JAL	JALDAPARA SANCTUARY
UP/S/KED	KEDARNATH SANCTUARY	WB/S/LOT	LOTHIAN ISLAND SANCTUARY
UP/S/KIS	KISHANPUR SANCTUARY	WB/S/RAM	RAMNABAGAN SANCTUARY
UP/S/MAH	MAHAVIR SWAMY SANCTUARY	WB/S/SAJ	SAJNAKHALI SANCTUARY
UP/S/MOT	MOTICHUR SANCTUARY +	WB/S/SEN	SENCAL SANCTUARY
UP/S/NAT	NATIONAL CHAMBAL SANCTUARY		

\* These are the 249 national parks and sanctuaries for which a filled-in questionnaire I was received prior to January 1987. Unless otherwise specified, the data base for this report is based on information from these areas (also see Introduction).

# Now a national park.

+ Chilla, Motichur, and Rajaji Sanctuaries have since ceased to exist, as their areas have been included in the Rajaji National Park.

# 1b. List of National Parks and Sanctuaries in Extended Database \*

Code	Name	Code	Name
A&N/N/MAR	MARINE NATIONAL PARK	GUJ/N/VEL	VELAVADAR NATIONAL PARK
A&N/N/MID	MIDDLE BUTTON ISLAND NATIONAL PARK	GUJ/S/BAR	BARDA SANCTUARY
A&N/N/MOU	MOUNT HARRIET NATIONAL PARK	GUJ/S/DHR	DHRANGADHRA SANCTUARY
A&N/N/NOR	NORTH BUTTON ISLAND NATIONAL PARK	GUJ/S/DUM	DUMKHAL SANCTUARY
A&N/N/SAD	SADDLE PEAK NATIONAL PARK	GUJ/S/HIN	HINGOLGADH SANCTUARY
A&N/N/SOU	SOUTH BUTTON ISLAND NATIONAL PARK	GUJ/S/JES	JESSORE SANCTUARY
A&N/S/BAT	BATTIMALVE ISLAND SANCTUARY	GUJ/S/KHI	KHIJADIYA SANCTUARY
A&N/S/CRO	CROCODILE (LOHABARRACK) SANCTUARY	GUJ/S/NAL	NALSAROVAR SANCTUARY
A&N/S/INT	INTERVIEW ISLAND SANCTUARY	GUJ/S/NAR	NARAYAN SAROVAR SANCTUARY
A&N/S/MEG	MEGAPODE ISLAND SANCTUARY	GUJ/S/RAT	RATANMAHAL SANCTUARY
A&N/S/NAR	NARCONDUM SANCTUARY		
A&N/S/NOR	NORTH REEF ISLAND SANCTUARY	HAR/S/SUL	SULTANPUR SANCTUARY
A&N/S/SOU	SOUTH SENTINEL SANCTUARY		
A&N/S/TIL	TILLANGCHONG ISLAND SANCTUARY	HP/N/GRE	GREAT HIMALAYAN NATIONAL PARK
AP/S/COR	CORINGA SANCTUARY	HP/N/PIN	PIN VALLEY NATIONAL PARK
AP/S/ETU	ETURNAGARAM SANCTUARY	HP/S/BAN	BANDLI SANCTUARY
AP/S/KAW	KAWAL SANCTUARY	HP/S/CHA	CHAIL SANCTUARY
AP/S/KIN	KINNERSANI SANCTUARY	HP/S/DARA	DARANGHATI (I & II) SANCTUARY
AP/S/KOL	KOLLERU SANCTUARY	HP/S/DARL	DARLAGHAT SANCTUARY
AP/S/MAN	MANJIRA SANCTUARY	HP/S/GAM	GAMGUL SLAHBEHI SANCTUARY
AP/S/NAG	NAGARJUNASAGAR SRISAILAM SANCTUARY	HP/S/GOB	GOBIND SAGAR SANCTUARY
AP/S/NEE	NEELAPATTU SANCTUARY	HP/S/KAI	KAIS SANCTUARY
AP/S/PAK	PAKHAL SANCTUARY	HP/S/KAL	KALATOP KHAJJAR SANCTUARY
AP/S/PAP	PAPIKONDA SANCTUARY	HP/S/KAN	KANAWAR SANCTUARY
AP/S/POC	POCHARAM SANCTUARY	HP/S/KHO	KHOKHAN SANCTUARY
AP/S/PRA	PRANHITA SANCTUARY	HP/S/KUG	KUGTI SANCTUARY
AP/S/PUL	PULICAT SANCTUARY	HP/S/LIP	LIPPA ASRANG SANCTUARY
AP/S/SIW	SIWARAM SANCTUARY	HP/S/MAJ	MAJATHAL SANCTUARY
ARU/N/NAM	NAMDAPHA NATIONAL PARK	HP/S/MAN	MANALI SANCTUARY
ARU/S/ITA	ITANAGAR SANCTUARY	HP/S/NAI	NAINA DEVI SANCTUARY
ARU/S/LAL	LALI SANCTUARY	HP/S/NAR	NARGU SANCTUARY
ARU/S/MEH	MEHAO SANCTUARY	HP/S/PON	PONG DAM SANCTUARY
ARU/S/PAK	PAKHUI SANCTUARY	HP/S/RAK	RAKCHHAM CHITKUL SANCTUARY
BIH/S/BHI	BHIMBANDH SANCTUARY	HP/S/REN	RENUKA SANCTUARY
BIH/S/DAL	DALMA SANCTUARY	HP/S/RUP	RUPI BHABA SANCTUARY
BIH/S/GAU	GAUTAM BUDHA SANCTUARY	HP/S/SEC	SECHU TUAN NALA SANCTUARY
BIH/S/HAZ	HAZARIBAGH SANCTUARY	HP/S/SHIK	SHIKARI DEVI SANCTUARY
BIH/S/LAW	LAWALONG SANCTUARY	HP/S/SHIL	SHILI SANCTUARY
BIH/S/PAL	PALAMAU SANCTUARY #	HP/S/SHIM	SHIMLA WATER CATCHMENT AREA
BIH/S/RAJ	RAJGIR SANCTUARY	HP/S/SIM	SIMBALBARA SANCTUARY
BIH/S/TOP	TOPCHANCHI SANCTUARY	HP/S/TAL	TALRA SANCTUARY
BIH/S/VAL	VALMIKI NAGAR SANCTUARY	HP/S/TIR	TIRTHAN SANCTUARY
CHA/S/SUK	SUKHNA SANCTUARY	HP/S/TUN	TUNDAH SANCTUARY
GOA/N/DHA	BHAGWAN MAHAVIR NATIONAL PARK	J&K/N/DAC	DACHIGAM NATIONAL PARK
GOA/S/BHA	BHAGWAN MAHAVIR SANCTUARY	J&K/N/HEM	HEMIS HIGH ALTITUDE NATIONAL PARK
GOA/S/BON	BONDLA SANCTUARY	J&K/N/KIS	KISHTWAR NATIONAL PARK
GOA/S/COT	COTIGAO SANCTUARY	J&K/S/JAS	JASROTA SANCTUARY
GUJ/N/BAN	BANSDA NATIONAL PARK	J&K/S/LUN	LUNGNAG SANCTUARY
GUJ/N/GIR	GIR NATIONAL PARK	J&K/S/NAN	NANDINI SANCTUARY
GUJ/N/MAR	MARINE NATIONAL PARK	J&K/S/OVE	OVERA SANCTUARY
		J&K/S/RAM	RAMNAGAR SANCTUARY
		J&K/S/SUR	SURINSAR MANSAR SANCTUARY
		KAR/N/BAND	BANDIPUR NATIONAL PARK

Code	Name	Code	Name
KAR/N/BANN	BANNERGHATTA NATIONAL PARK	MP/N/PAN	PANNA NATIONAL PARK
KAR/N/NAG	NAGARHOLE NATIONAL PARK	MP/N/PEN	PENCH NATIONAL PARK
KAR/S/ADI	ADICHUNCHANAGIRI SANCTUARY	MP/N/SAN	SANJAY NATIONAL PARK
KAR/S/BHA	BHADRA SANCTUARY	MP/N/SAT	SATPURA NATIONAL PARK
KAR/S/BIL	BILIGIRI RANGASWAMY SANCTUARY	MP/N/VAN	VAN VIHAR NATIONAL PARK
KAR/S/BLA	BLACK BUCK (RANEENNUR) SANCTUARY	MP/S/ACH	ACHANKMAR SANCTUARY
KAR/S/BRA	BRAHMAGIRI SANCTUARY	MP/S/BAD	BADALKHOL SANCTUARY
KAR/S/DAN	DANDELI SANCTUARY	MP/S/BAG	BAGDARA SANCTUARY
KAR/S/GHA	GHATAPRABHA SANCTUARY	MP/S/BAR	BARNAWAPARA SANCTUARY
KAR/S/MEL	MELKOTA TEMPLE SANCTUARY	MP/S/BHA	BHAIRAMGARH SANCTUARY
KAR/S/MOO	MOOKAMBIKA SANCTUARY	MP/S/BOR	BORI SANCTUARY
KAR/S/NUG	NUGU SANCTUARY	MP/S/GAN	GANDHI SAGAR SANCTUARY
KAR/S/RAN	RANGANATHITTU SANCTUARY	MP/S/GHA	GHATIGAON-GREAT INDIAN BUSTARD SANCTUARY
KAR/S/SHA	SHARAVATHI VALLEY SANCTUARY	MP/S/GOM	GOMARDA SANCTUARY
KAR/S/SHE	SHETTYHALLY SANCTUARY	MP/S/KAR	KARERA-GREAT INDIAN BUSTARD SANCTUARY
KAR/S/SOM	SOMESWARA SANCTUARY	MP/S/KEN	KEN GHARIAL SANCTUARY
KER/N/ERA	ERAVIKULAM NATIONAL PARK	MP/S/KHA	KHARMORE SANCTUARY
KER/N/PER	PERIYAR NATIONAL PARK	MP/S/KHE	KHEONI SANCTUARY
KER/N/SIL	SILENT VALLEY NATIONAL PARK	MP/S/NAR	NARSINGARH SANCTUARY
KER/S/ARA	ARALAM SANCTUARY	MP/S/NAT	NATIONAL CHAMBAL SANCTUARY
KER/S/CHIM	CHIMONY SANCTUARY	MP/S/NAU	NAURADEHI SANCTUARY
KER/S/CHIN	CHINNAR SANCTUARY	MP/S/PAC	PACHMARHI SANCTUARY
KER/S/IDU	IDUKKI SANCTUARY	MP/S/PAL	PALPUR KUND SANCTUARY
KER/S/NEY	NEYYPAR SANCTUARY	MP/S/PAM	PAMED SANCTUARY
KER/S/PAR	PARAMBIKULAM SANCTUARY	MP/S/PAN	PANPATHA SANCTUARY
KER/S/PEE	PEECHI VAZHANI SANCTUARY	MP/S/PEN	PENCH SANCTUARY
KER/S/PEP	PEPPARA SANCTUARY	MP/S/PHE	PHEN SANCTUARY
KER/S/SHE	SHENDURNEY SANCTUARY	MP/S/RAT	RATAPANI SANCTUARY
KER/S/THA	THATTEKKAD SANCTUARY	MP/S/SAI	SAILANA SANCTUARY
KER/S/WYN	WYNAD SANCTUARY	MP/S/SAN	SANJAY (DUBRI) SANCTUARY
MAH/N/NAW	NAWEGAON NATIONAL PARK	MP/S/SEM	SEMAROT SANCTUARY
MAH/N/PEN	PENCH NATIONAL PARK	MP/S/SIN	SINGHORI SANCTUARY
MAH/N/SAN	SANJAY GANDHI NATIONAL PARK	MP/S/SIT	SITANADI SANCTUARY
MAH/N/TAD	TADOBA NATIONAL PARK	MP/S/SON	SON GHARIAL SANCTUARY
MAH/S/BHI	BHIMASHANKAR SANCTUARY	MP/S/TAM	TAMOR PINGLA SANCTUARY
MAH/S/BOR	BOR SANCTUARY	MP/S/UDA	UDANTI SANCTUARY
MAH/S/DEU	DEULGAON SANCTUARY	NAG/S/INT	INTANKI SANCTUARY
MAH/S/DHA	DHAKNA KOLKAZ SANCTUARY	ORI/N/SIM	SIMLIPAL NATIONAL PARK
MAH/S/GRE	GREAT INDIAN BUSTARD SANCTUARY	ORI/S/BAI	BAISIPALLI (MAHANADI) SANCTUARY
MAH/S/KAL	KALSUBAI HARISHCHANDRAGADH SANCTUARY	ORI/S/BHI	BHITTAR KANIKA SANCTUARY
MAH/S/KAR	KARNALA SANCTUARY	ORI/S/CHA	CHANDKA DAMPARA SANCTUARY
MAH/S/KIN	KINWAT SANCTUARY	ORI/S/HAD	HADGARH SANCTUARY
MAH/S/MEL	MELGHAT SANCTUARY	ORI/S/NAN	NANDANKANAN SANCTUARY
MAH/S/NAG	NAGZIRA SANCTUARY	ORI/S/SAT	SATKOSIA GORGE SANCTUARY
MAH/S/NAN	NANDUR MADHMESHWAR SANCTUARY	ORI/S/SIM	SIMLIPAL SANCTUARY
MAH/S/PHA	PHANSAD SANCTUARY	RAJ/N/DES	DESERT NATIONAL PARK
MAH/S/RAD	RADHANAGARI SANCTUARY	RAJ/N/KEO	KEOLADEO NATIONAL PARK
MAH/S/TAN	TANSA SANCTUARY	RAJ/N/RAN	RANTHAMBORE NATIONAL PARK
MAH/S/YAW	YAWAL SANCTUARY	RAJ/N/SAR	SARISKA NATIONAL PARK
MAN/N/KEI	KEIBUL LAMJAO NATIONAL PARK	RAJ/S/BHE	BHENSRODGARH SANCTUARY
MAN/N/SIR	SIROY NATIONAL PARK	RAJ/S/DAR	DARAH SANCTUARY
MEG/S/NON	NONGKHYLLEM SANCTUARY	RAJ/S/JAI	JAISAMAND SANCTUARY
MEG/S/SIJ	SIJU SANCTUARY	RAJ/S/JAM	JAMVA-RAMGARH SANCTUARY
MIZ/S/DAM	DAMPA SANCTUARY	RAJ/S/JAW	JAWAHAR SAGAR SANCTUARY
MP/N/BAN	BANDHAVGARH NATIONAL PARK	RAJ/S/KAI	KAILA DEVI SANCTUARY
MP/N/FOS	FOSSIL NATIONAL PARK	RAJ/S/KUM	KUMBHALGARH SANCTUARY
MP/N/IND	INDRAVATI NATIONAL PARK	RAJ/S/MOU	MOUNT ABU SANCTUARY
MP/N/KANG	KANGER GHATI NATIONAL PARK	RAJ/S/NAH	NAHARGARH SANCTUARY
MP/N/KANH	KANHA NATIONAL PARK	RAJ/S/NAT	NATIONAL GHARIAL SANCTUARY
MP/N/MAD	MADHAV NATIONAL PARK	RAJ/S/PHU	PHULWARI SANCTUARY
		RAJ/S/RAM	RAMGARH SANCTUARY
		RAJ/S/SAR	SARISKA SANCTUARY

## 88 MANAGEMENT OF NATIONAL PARKS AND SANCTUARIES

Code	Name	Code	Name
RAJ/S/SHE	SHERGARH SANCTUARY	UP/N/NAN	NANDA DEVI NATIONAL PARK
RAJ/S/SIT	SITA MATA SANCTUARY	UP/N/VAL	VALLEY OF FLOWERS NATIONAL PARK
RAJ/S/TAL	TAL CHAPPER SANCTUARY	UP/S/CHA	CHANDRAPRABHA SANCTUARY
RAJ/S/TOD	TODGARH RAOLI SANCTUARY	UP/S/CHI	CHILLA SANCTUARY +
RAJ/S/VAN	VAN VIHAR SANCTUARY	UP/S/GOV	GOVIND PASHUVIHAR SANCTUARY
SIK/N/KHA	KHANGCHENDZONGA NATIONAL PARK	UP/S/KAI	KAIMUR SANCTUARY
SIK/S/FAM	FAMBUNG LHO SANCTUARY	UP/S/KAT	KATERNIAGHAT SANCTUARY
TN/N/GUI	GUINDY NATIONAL PARK	UP/S/KED	KEDARNATH SANCTUARY
TN/S/ANA	ANAMALAI SANCTUARY	UP/S/KIS	KISHANPUR SANCTUARY
TN/S/KAL	KALAKAD SANCTUARY	UP/S/MAH	MAHAVIR SWAMY SANCTUARY
TN/S/MUD	MUDUMALAI SANCTUARY	UP/S/MOT	MOTICHUR SANCTUARY +
TN/S/MUN	MUNDANTHURAI SANCTUARY	UP/S/NAT	NATIONAL CHAMBAL SANCTUARY
TN/S/NIL	NILGIRI TAHR SANCTUARY	UP/S/NAW	NAWABGANJ SANCTUARY
TN/S/POI	POINT CALIMERE SANCTUARY	UP/S/RAJ	RAJAJI SANCTUARY +
TN/S/PUL	PULICAT SANCTUARY	UP/S/RAN	RANIPUR SANCTUARY
TN/S/VED	VEDANTHANGAL SANCTUARY	WB/N/SUN	SUNDERBANS NATIONAL PARK
UP/N/COR	CORBETT NATIONAL PARK	WB/S/BAL	BALLAVPUR SANCTUARY
UP/N/DUD	DUDHWA NATIONAL PARK	WB/S/JAL	JALDAPARA SANCTUARY
		WB/S/RAM	RAMNABAGAN SANCTUARY
		WB/S/SAJ	SAJNAKHALI SANCTUARY

\* For an explanation of the 'extended database', see Introduction.

# Now a national park.

+ Chilla, Motichur, and Rajaji Sanctuaries have since ceased to exist, as their areas have been included in the Rajaji National Park.

## 2. Wild Life (Protection) Act 1972 (Extract)

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### CHAPTER IV

#### SANCTUARIES, NATIONAL PARKS, GAME RESERVES AND CLOSED AREAS

##### Sanctuaries

###### *Declaration of sanctuary*

18. (1) The State Government may, by notification, declare any area to be a sanctuary if it considers that such area is of adequate ecological, faunal, floral, geomorphological, natural or zoological significance, for the purpose of protecting, propagating or developing wild life or its environment.

(2) The notification referred to in sub-section (1) shall specify, as nearly as possible, the situation and limits of such area.

Explanation: For the purposes of this section, it shall be sufficient to describe the area by roads, rivers, ridges or other well-known or readily intelligible boundaries.

###### *Collector to determine rights*

19. Whenever any area is declared to be a sanctuary, the Collector shall inquire into, and determine, the existence, nature and extent of the rights of any person in or over the land comprised within the limits of the sanctuary.

###### *Bar of accrual of rights*

20. After the issue of a notification under section 18, no right shall be acquired in, on or over the land comprised within the limits of the area specified in such notification, except by succession, testamentary or intestate.

###### *Proclamation by Collector*

21. When a notification has been issued under section 18, the Collector shall publish in the regional language in every town and village in or in the neighbourhood of the area comprised therein, a proclamation

- (a) specifying, as nearly as possible, the situation and the limits of the sanctuary; and
- (b) requiring any person, claiming any right mentioned in section 19, to prefer before the Collector, within two months from the date of such proclamation, a written claim in the prescribed form, specifying the nature and extent of such right with necessary details and the amount and particulars of compensation, if any, claimed in respect thereof.

###### *Inquiry by Collector*

22. The Collector shall, after service of the prescribed notice upon the claimant, expeditiously inquire into

- (a) the claim preferred before him under clause (b) of section 21, and
  - (b) the existence of any right mentioned in section 19 and not claimed under clause (b) of section 21.
- so far as the same may be ascertainable from the records of the State Government and the evidence of any person acquainted with the same.

###### *Powers of Collector*

23. For the purpose of such inquiry, the Collector may exercise the following powers, namely

- (a) the power to enter in or upon any land and to survey, demarcate and make a map of the same or to authorise any other officer to do so;

- (b) the same powers as are vested in a civil court for the trial of suits.

*Acquisition of rights*

24. (1) In the case of a claim to a right in or over any land referred to in section 19, the Collector shall pass an order admitting or rejecting the same in whole or in part.
- (2) If such claim is admitted in whole or in part, the Collector may either
- (a) exclude such land from the limits of the proposed sanctuary, or
  - (b) proceed to acquire such land or rights, except where by an agreement between the owner of such land or holder of rights and the Government, the owner or holder of such rights has agreed to surrender his rights to the Government, in or over such land, and on payment of such compensation, as is provided in the Land Acquisition Act 1894

*Acquisition proceedings*

25. (1) For the purpose of acquiring such land, or rights in or over such land,
- (a) the Collector shall be deemed to be a Collector, proceeding under the Land Acquisition Act, 1894;
  - (b) the claimant shall be deemed to be a person interested and appearing before him in pursuance of a notice given under section 9 of that Act;
  - (c) the provisions of the sections, preceding section 9 of that Act, shall be deemed to have been complied with;
  - (d) where the claimant does not accept the award made in his favour in the matter of compensation, he shall be deemed, within the meaning of section 18 of that Act, to be a person interested who has not accepted the award, and shall be entitled to proceed to claim relief against the award under the provision of Part III of that Act;
  - (e) the Collector, with the consent of the claimant, or the court, with the consent of both the parties, may award compensation in land or money or partly in land and partly in money; and
  - (f) in the case of the stoppage of a public way or a common pasture, the Collector may, with the previous sanction of the State Government, provide for an alternative public way or common pasture, as far as may be practicable or convenient.
- (2) The acquisition under this Act of any land or interest therein shall be deemed to be acquisition for a public purpose.

*Delegation of Collector's*

26. The State Government may, by general or special order, direct that the powers exercisable or the functions to be performed by the Collector under sections 19 to 25 (both inclusive) may be exercised and performed by such other officer as may be specified in the order.

*Restriction on entry in sanctuary*

27. (1) No person other than
- (a) a public servant on duty,
  - (b) a person who has been permitted by the Chief Wild Life Warden or the authorised officer to reside within the limits of the sanctuary,
  - (c) a person who has any right over immovable property within the limits of the sanctuary,
  - (d) a person passing through the sanctuary along a public highway, and
  - (e) the dependents of the person referred to in clause (a), clause (b) or clause (c), shall enter or reside in the sanctuary, except under and in accordance with the conditions of a permit granted under section 28.
- (2) Every person shall, so long as he resides in the sanctuary, be bound
- (a) to prevent the commission, in the sanctuary, of an offence against this Act;
  - (b) where there is reason to believe that any such offence against this Act has been committed in such sanctuary, to help in discovering and arresting the offender;
  - (c) to report the death of any wild animal and to safeguard its remains until the Chief Wild Life Warden or the authorised officer takes charge thereof;

- (d) to extinguish any fire in such sanctuary of which he has knowledge or information and the prevent from spreading, by any lawful means in his power, any fire within the vicinity of such sanctuary of which he has knowledge or information; and
- (e) to assist any forest officer, Chief Wild Life Warden, Wild Life Warden or police officer demanding his aid for preventing the commission of any offence against this Act or in the investigation of any such offence.

***Grant of permit***

28. (1) The Chief Wild Life Warden may, on application, grant to any person a permit to enter or reside in a sanctuary for all or any of the following purposes, namely :-

- (a) investigation or study of wild life and purposes ancillary or incidental thereto;
- (b) photography;
- (c) scientific research;
- (d) tourism;
- (e) transaction of lawful business with any person residing in the sanctuary.

(2) A permit to enter or reside in a sanctuary shall be issued subject to such conditions and on payment of such fee as may be prescribed.

***Hunting in sanctuary without permit prohibited***

29. (1) Notwithstanding anything contained elsewhere in this Act, no person shall hunt any wild animal in a sanctuary or remove therefrom any wild animal, whether alive or dead, or any trophy, uncured trophy, or meat derived from such animal.

Provided that if the Chief Wild Life Warden is satisfied that it is necessary that any wild animal in a sanctuary should be hunted or removed,

- (a) for the better protection of wild life, or
- (b) for any other good and sufficient reason

he may, with the previous approval of the State Government, grant a permit authorising any person to hunt or remove such wild animal under the direction of an officer authorised by him or cause it to be hunted or removed.

(2) A permit granted under sub-section (1) shall specify the kind and number of wild animals that may be hunted or removed by the holder of such permit.

(3) The Chief Wild Life Warden may, for good and sufficient reason, to be recorded in writing, cancel any permit granted under section 28 or under this section.

Provided that no such cancellation shall be made except after giving the holder of the permit a reasonable opportunity of being heard.

(4) Any person aggrieved by the cancellation of a permit under subsection (3) may, within fifteen days from the date of such cancellation, appeal to the State Government, whose decision shall be final.

Provided that the State Government may admit any appeal preferred after the expiry of the period aforesaid if it is satisfied that the appellant had sufficient cause for not preferring the appeal in time.

***Causing fire prohibited***

30. No person shall set fire to a sanctuary, or kindle any fire, or leave any fire burning, in a sanctuary, in such manner as to endanger such sanctuary.

***Prohibition of entry into sanctuary with weapon***

31. No person shall enter a sanctuary with any weapon except with the previous permission in writing of the Chief Wild Life Warden or the authorised officer.

***Ban on use of injurious substances***

32. No person shall use, in a sanctuary, chemicals, explosives or any other substances which may cause injury to, or endanger, any wild life in such sanctuary.

*Control of sanctuaries*

33. The Chief Wild Life Warden shall be the authority who shall control, manage and maintain all sanctuaries and for that purpose, within the limits of any sanctuary

- (a) may construct such roads, bridges, buildings, fences or barrier gates, and carry out such other works as he may consider necessary for the purposes of such sanctuary;
- (b) shall take such steps as will ensure the security of wild animals in the sanctuary and the preservation of the sanctuary and wild animals therein;
- (c) may take such measures, in the interest of wild life, as he may consider necessary for the improvement of any habitat;
- (d) may regulate, control or prohibit, in keeping with the interest of wild life, the grazing or movement of cattle;
- (e) may regulate, control or prohibit, any fishing.

*Registration of certain persons in possession of arms*

34. (1) Within three months from the declaration of any area as a sanctuary, every person residing in or within ten kilometres of any such sanctuary and holding a license granted under the Arms Act, 1959, for the possession of arms or exempted from the provisions of that Act and possessing arms, shall apply in such form, on payment of such fee and within such time as may be prescribed, to the Chief Wild Life Warden or the authorised officer, for the registration of his name.

(2) On receipt of an application under sub-section (1), the Chief Wild Life Warden or the authorised officer shall register the name of the applicant in such manner as may be prescribed.

**National Parks***Declaration of National Parks*

35. (1) Whenever it appears to the State Government that an area, whether within a sanctuary or not, is, by reason of its ecological, faunal, floral, geomorphological or zoological association or importance, needed to be constituted as a National Park for the purpose of protecting, propagating or developing wild life therein or its environment, it may, by notification, declare its intention to constitute such area as a National Park.

(2) The notification referred to in sub-section (1) shall define the limits of the area which is intended to be declared as a National Park.

(3) Where any area is intended to be declared as a National Park, the provisions of sections 19 to 26 (both inclusive) shall, as far as may be, apply to the investigation and determination of claims, and extinguishment of rights, in relation to any land in such area as they apply to the said matters in relation to any land in a sanctuary.

(4) When the following events have occurred, namely,

- (a) the period for preferring claims has elapsed, and all claims, if any, made in relation to any land in an area intended to be declared as a National Park, have been disposed of by the State Government, and
- (b) all rights in respect of lands proposed to be included in the National Park have become vested in the State Government,

comprised within the National Park and declare that the said area shall be a National Park on and from such date as may be specified in the notification.

(5) No alteration of the boundaries of a National Park shall be made except on a resolution passed by the Legislature of the State.

(6) No person shall destroy, exploit or remove any wild life from a National Park or destroy or damage the habitat of any wild animal or deprive any wild animal of its habitat within such National Park except under and in accordance with a permit granted by the Chief Wild Life Warden and no such permit shall be granted unless the State Government, being satisfied that such destruction, exploitation or removal of wild life from the National Park is necessary for the improvement and better management of wild life therein, authorises the issue of such permit.

(7) No grazing of any cattle shall be permitted in a National Park and no cattle shall be allowed to enter therein except where such cattle is used as a vehicle by a person authorised to enter such National Park.

(8) The provisions of sections 27 and 28, section 30 to 32 (both inclusive, and clauses (a), (b) and (c) of section 33, and section 34 shall, as far as may be, apply in relation to a National Park as they apply in relation to a sanctuary.

#### Game Reserve

##### *Declaration of game reserve*

36. (1) The State Government may, by notification, declare any area to be a game reserve.  
 (2) No hunting of any wild animal shall be permitted in such reserve except under and in accordance with a license issued under this section by the Chief Wild Life Warden or the authorised officer.

#### Closed Area

##### *Declaration of closed area*

37. (1) The State Government may, by notification, declare any area closed to hunting for such period as may be specified in the notification.  
 (2) No hunting of any wild animal shall be permitted in a closed area during the period specified in the notification referred to in sub-section (1).

#### Sanctuaries or National Parks declared by Central Government

##### *Power of Central Government to declare areas as sanctuaries or National Parks*

- 38 (1) Where the State Government leases or otherwise transfers any area under its control not being an area within a sanctuary, to the Central Government, the Central Government may, if it is satisfied that the conditions specified in section 18 are fulfilled in relation to the area so transferred to it, declare such area, by notification, to be a Sanctuary and the provisions of sections 19 to 35 (both inclusive), 54 and 55 shall apply in relation to such Sanctuary as they apply in relation to a Sanctuary declared by the State Government.  
 (2) The Central Government may, if it is satisfied that the conditions specified in section 35 are fulfilled in relation to any area referred to in sub-section (1), whether or not such area has been declared to be a Sanctuary by the Central Government or the State Government, declare such area, by notification, to be a National Park and the provisions of sections 35, 54 and 55 shall apply in relation to such National Park as they apply in relation to a National Park declared by the State Government.  
 (3) In relation to a Sanctuary or National Park declared by the Central Government, the powers and duties of the Chief Wild Life Warden under the sections referred to in sub-sections (1) and (2) shall be exercised and discharged by the Director or by such other officer as may be authorised by the Director in this behalf and references, in the sections aforesaid, to the State Government shall be construed as references to the Central Government and reference therein to the Legislature of the State shall be construed as a reference to Parliament.

### 3. Animals Listed in the Wildlife (Protection) Act 1972, Giving English Name, Scientific Name, and Schedule Number \*

(Revised list) <sup>s</sup>		
<i>English Name</i>	<i>Scientific Name</i>	<i>Sch./Part</i>
MAMMALS		
ANTELOPE, FOUR HORNED	TETRACERUS QUADRICORNIS	1
ANTELOPE, TIBETAN OR CHIRU	PANTHOLOPS HODGSONI	1
ASS, INDIAN WILD	EQUUS HEMIONUS KHUR	1
ASS, TIBETAN WILD	EQUUS HEMIONUS KIANG	1
BEAR, HIMALAYAN BLACK	SELENARCTOS THIBETANUS	2/2
BEAR, HIMALAYAN BROWN	URSUS ARCTOS	2/2
BEAR, MALAY OR SUN	HELARCTOS MALAYANUS	1
BEAR, SLOTH	MELURSUS URSINUS	1
BHARAL (BLUE SHEEP)	PSEUDOIS NAYAU	1
BINTURONG	ARCTICTIS BINTURONG	1
BISON OR GAUR	BOS GAURUS	2/1
BUCK, BLACK	ANTELOPE CERVICAPRA	1
BUFFALO, WILD	BUBALUS BUBALIS	1
CARACAL	FELIS CARACAL	1
CAT, DESERT	FELIS LIBYCA	1
CAT, FISHING	FELIS VIVERRINA	1
CAT, GOLDEN	FELIS TEMMINCKI	1
CAT, JUNGLE	FELIS CHAUS	4
CAT, LEOPARD	FELIS BENGALENSIS	1
CAT, MARBLED	FELIS MARMORATA	1
CAT, PALLAS'	FELIS MANUL	1
CAT, RUSTY SPOTTED	FELIS RUBIGINOSA	1
CETACEAN SPECIES		1
CHEETAH	ACINONYX JUBATUS	1
CIVET, MALABAR	VIVERRA MEGASPILA	1
CIVETS	ALL SPECIES OF VIVERRIDAE EXCEPT MALABAR CIVET #	4
DEER, BARKING OR MUNTJAC	MUNTIACUS MUNTJAK	3
DEER, BROW-ANTLERED OR THAMIN	CERVUS ELDI	1
DEER, HOG	AXIS PORCINUS	3
DEER, MOUSE	TRAGULUS MEMINNA	1
DEER, MUSK	MOSCHUS MOSCHIFERUS	1
DEER, SPOTTED (CHITAL)	AXIS AXIS	3
DEER, SWAMP	ALL SUB-SPECIES OF CERVUS DUVAUCELI	1
DOG, WILD OR DHOLE	CUON ALPINUS	2/1
DUGONG	DUGONG DUGON	1
ELEPHANT, INDIAN	ELEPHAS MAXIMUS	1
ERMINE	MUSTELA ERMINEA	4
FERRET-BADGER, CHINESE	MELOGALE MOSCHATA	2/1

FERRET-BADGER, BURMESE	MELOGALE PERSONATA	2/1
FOX, COMMON/INDIAN	VULPES BENGALENSIS	4
FOX, RED	VULPES VULPES	4
FOX, TIBETAN **	VULPES FERRILATUS	4
GAZELLE, INDIAN (CHINKARA)	GAZELLA GAZELLA BENNETTI	1
GAZELLE, TIBETAN	PROCAPRA PICTICAUDATA	1
GIBBON, HOOLOCK	HYLOBATES HOOLOCK	1
GORAL	NEMORHAEDUS GORAL (GORAL & HODGSONI)	3
HARE, BLACK NAPED	LEPUS NIGRICOLLIS NIGRICOLLIS	4
HARE, COMMON INDIAN	LEPUS NIGRICOLLIS	4
HARE, DESERT	LEPUS NIGRICOLLIS DAYANUS	4
HARE, HISPID	CAPROLAGUS HISPIDUS	1
HEDGEHOG, LONGEARED	HEMIECHINUS AURITUS	4
HOG-BADGER	ARCTONYX COLLARIS	1
HOG, PYGMY	SUS SALVANUS	1
HYENA	HYAENA HYAENA	3
IBEX, HIMALAYAN	CAPRA IBEX SIBIRICA	1
JACKAL	CANIS AUREUS	4
LANGUR, CAPPED	PRESBYTIS PILEATUS	1
LANGUR, GOLDEN	PRESBYTIS GEEI	1
LANGUR, HANUMAN	PRESBYTIS ENTELLUS	2/1
LANGUR, NILGIRI	PRESBYTIS JOHNI	2/2
LEOPARD OR PANTHER	PANTHERA PARDUS	1
LEOPARD, CLOUDED	NEOFELIS NEBULOSA	1
LEOPARD, SNOW	PANTHERA Uncia	1
LINSANG, SPOTTED	PRIONODON PARDICOLOR	1
LION, INDIAN	PANTHERA LEO PERSICA	1
LORIS, SLOW	NYCTICEBUS COUCANG	1
LORIS, SLENDER	LORIS TARDIGRADIUS	1
MACAQUE, ASSAMESE	MACACA ASSAMENSIS	2/1
MACAQUE, BONNET	MACACA RADIATA	2/1
MACAQUE, CRABEATING	MACACA IRUS UMBROSA	1
MACAQUE, LIONTAILED	MACACA SILENUS	1
MACAQUE, PIGTAILED	MACACA NEMESTRINA	2/1
MACAQUE, RHESUS	MACACA MULATTA	2/1
MACAQUE, STUMPTAILED	MACACA SPECIOSA	2/1
MARKHOR	CAPRA FALCONERI	1
MARMOT, HIMALAYAN	MARMOTA BOBAK HIMALAYANA	4
MARMOT, LONGTAILED	MARMOTA CAUDATA	4
MARTEN, BEECH OR STONE	MARTES FOINA INTERMEDIA	4
MARTEN, YELLOWTHROATED	MARTES FLAVIGULA	4
MARTEN, NILGIRI	MARTES GWATKINSI	4
MONGOOSES @	HERPESTES SPP.	4
MONKEY, LEAF	PRESBYTIS PILEATUS	1
MOUSE-HARE, HIMALAYAN	OCHOTONA ROYLEI	4
NILCAI (BLUE BULL)	BOSELAPHUS TRAGOCAMELUS	3
NYAN	OVIS AMMON HODGSONI	1
OTTER, COMMON	LUTRA LUTRA	2/1
OTTER, SMOOTH INDIAN	LUTRA PERSPICILLATA	2/1
OTTER, CLAWLESS	AONYX CINEREA	2/1
PANDA, RED OR LESSER	AILURUS FULGENS	1
PANGOLIN, INDIAN	MANIS CRASSICAUDATA	1
PANGOLIN, CHINESE	MANIS PENTADACTYLA	1
PIG, ANDAMAN WILD	SUS SCROFA ANDAMANENSIS	1

PIG, INDIAN WILD	<i>SUS SCROFA CRISTATUS</i>	3
POLECAT, MARBLED	<i>VORMELA PEREGUSNA</i>	4
POLECAT, TIBETAN	<i>MUSTELA PUTORIUS</i>	4
PORCUPINE, BRUSHTAILED	<i>ATHERURUS MACRORURUS</i>	
	<i>ASSAMENSIS</i>	2/1
PORCUPINE, HIMALAYAN CRESTLESS	<i>HYSTRIX HODGSONI</i>	2/1
PORCUPINE, INDIAN	<i>HYSTRIX INDICA</i>	4
PORPOISE, LITTLE INDIAN	<i>NEOMERIS PHOCAENOIDES</i>	4
RATEL	<i>MELLIVORA CAPENSIS</i>	1
RHINOCEROS, GREAT INDIAN	<i>RHINOCEROS UNICORNIS</i>	1
SAMBAR	<i>CERVUS UNICOLOR</i>	3
SEROW	<i>CAPRICORNIS SUMATRAENSIS</i>	1
SQUIRREL, FIVESTRIPED PALM	<i>FUNAMBULUS PENNANTI</i>	4
SQUIRREL, FLYING	ALL SPECIES OF THE GENUS	
	<i>HYLOPETES, PETAURISTA, BELOMYS,</i>	
	<i>&amp; EUPETAURUS</i>	1
SQUIRREL, SMALL TRAVANCORE		
FLYING	<i>PETINOMYS FUSCOCAPILLUS</i>	1
SQUIRREL, GRIZZLED GIANT	<i>RATUFA MACROURA</i>	2/2
SQUIRREL, INDIAN GIANT	<i>RATUFA INDICA</i>	2/2
SQUIRREL, MALAYAN GIANT	<i>RATUFA BICOLOR</i>	2/2
STAG, KASHMIR (HANGUL)	<i>CERVUS ELAPHUS HANGLI</i>	1
TAHR, HIMALAYAN	<i>HEMITRAGUS JEMLAHICUS</i>	1
TAHR, NILGIRI	<i>HEMITRAGUS HYLOCRUIUS</i>	1
TAKIN OR MISHMI TAKIN	<i>BUDORCAS TAXICOLOR</i>	1
TIGER	<i>PANTHERA TIGRIS</i>	1
URIAL OR SHAPU	<i>OVIS ORIENTALIS VIGNEI</i>	1
VOLES +		4
WEASEL, HIMALAYAN	<i>MUSTELA SIBIRICA</i>	4
WEASEL, YELLOWBELLIED	<i>MUSTELA KATHIAH</i>	4
WEASEL, PALE	<i>MUSTELA ALTAICA</i>	4
WOLF, INDIAN	<i>CANIS LUPUS PALLIPES</i>	1
WOLF, TIBETAN	<i>CANIS LUPUS CHANCO?</i>	2/2
YAK, WILD	<i>BOS GRUNNIENS</i>	1

## BIRDS

BAZA, BLYTH'S	<i>AVICEDA JEORDONI</i>	1
BAZA, INDIAN BLACKCRESTED	<i>AVICEDA LEUPHOTES</i>	1
BUSTARD, GREAT INDIAN	<i>CHORIOTIS NIGRICEPS</i>	1
BUSTARD, HOUBARA	<i>CHLAMYDOTIS UNDULATA</i>	1
COURSER, JERDON'S	<i>CURSURIUS BITORQUATUS</i>	1
CRANE, BLACKNECKED	<i>GRUS NIGRICOLLIS</i>	1
CRANE, HOODED	<i>GRUS MONACHA</i>	1
CRANE, SIBERIAN WHITE	<i>GRUS LEUCOGERANUS</i>	1
DUCK, PINKHEADED	<i>RHODONESSA CARYOPHYLLACEA</i>	1
DUCK, WHITE-WINGED WOOD	<i>CAIRINA SCUTILLATA</i>	1
EAGLE, WHITEBELLIED SEA	<i>HALIAEETUS LEUCOGASTER</i>	1
FALCON, PEREGRINE	<i>FALCO PEREGRINUS</i>	1
FALCON, SAKER (LANNER)	<i>FALCO BIARMICUS</i>	1
FLORICAN, BENGAL	<i>EUPODOTIS BENGALENSIS</i>	1
HAWKS	<i>ACCIPITRIDAE</i>	1
HORNBILL, INDIAN PIED	<i>ANTHRACOCEROS MALABARICUS</i>	1
HORNBILL, GREAT PIED	<i>BUCEROS BICORNIS</i>	1

HORNBILL, NARCONDAM	RHYTICEROS PLICATUS (NARCONDAMI)	1
HORNBILL, WHITETHROATED BROWN	PTILOLAEMUS TICKELLI AUSTENI	1
HORNBILL, RUFOUSNECKED	ACEROS NIPALENSIS	1
HORNBILL, WREATHED	RHYTICEROS UNDULATUS	1
MEGAPODE, NICOBAR	MEGAPODIUS FREYCINET	1
MERLIN, REDHEADED	FALCO CHICQUERA	1
MONAL, SCLATER'S	LOPHOPHORUS SCLATERI	1
OSPREY OR FISH EATING EAGLE	PANDION HALIAETUS	1
OWLET, FOREST SPOTTED	ATHENE BLEWITTI	1
PARTRIDGE, BAMBOO	BAMBUSICOLA FYTCHII	1
PEACOCK-PHEASANT	POLYPLECTRON BICALCARATUM	1
PEAFOWL, COMMON	PAVO CRISTATUS	1
PHEASANT, BLOOD	ITHAGINIS CRUENTUS TIBETANUS	1
PHEASANT, CHIR	CATREUS WALLICHII	1
PHEASANT, EARED	CROSSOPTILON CROSSOPTILON	1
PHEASANT, MONAL	LOPHOPHORUS IMPEJANUS	1
PHEASANT, MRS. HUME'S BARREDBACK	SYRMATICUS HUMIAE	1
PHEASANT, SCLATER'S	LOPHOPHORUS SCLATERI	1
PIGEON, NICOBAR	CALOENAS NICOBARICA	1
QUAIL, MOUNTAIN	OPHRYIA SUPERCILIOSA	1
SNOWCOCK, TIBETAN	TETRAOGALLUS TIBETANUS	1
SPOONBILL, WHITE	PLATALEA LEUCORODIA	1
STORK, EASTERN WHITE	CICONIA CICONIA BOYCIANA	1
TEAL, ANDAMAN	ANAS GIBBERIFRONS ALLOGULARIS	1
TEAL, LARGE WHISTLING	DENDROCYGNA BICOLOR	1
TRAGOPAN, BLYTH'S	TRAGOPAN BLYTHII	1
TRAGOPAN, SATYR	TRAGOPAN SATYRA	1
TRAGOPAN, TEMMINCK'S	TRAGOPAN TEMMINCKII	1
TRAGOPAN, WESTERN	TRAGOPAN MELANOCEPHALUS	1
VULTURE, BEARDED (LAMMERGEIER)	GYPHAETUS BARBATUS	1

## REPTILES

CHAMELEON	CHAMELEON ZEYLANICUS (CALCARATUS)	2/1
CROCODILE, FRESHWATER	CROCODILUS PALUSTRIS	1
CROCODILE, SALTWATER	CROCODILUS POROSUS	1
GHARIAL	GAVIALIS GANGETICUS	1
LIZARD, AGRA OR DESERT MONITOR	VARANUS GRISEUS DAUDIN	1
LIZARD, BARRED OVAL OR YELLOW MONITOR	VARANUS FLAVESCENS	1
LIZARD, COMMON INDIAN MONITOR	VARANUS BENGALENSIS	1
LIZARD, SPINY-TAILED OR SANDA	UROMASTYX HARDWICKII	2/1
LIZARD, WATER MONITOR	VARANUS SALVATOR	1
PYTHON, INDIAN	PYTHON MOLLURUS	1
PYTHON, RETICULATED	PYTHON RETICULATUS	1
SNAKE, INDIAN EGG-EATING	ELACHISTODON WESTERMANNI	1
TORTOISE	TESTUDINIDAE, TRIONYCHIDAE ?	4
TURTLE, GANGES SOFT-SHELLED	TRIONYX GANGETICUS	1
TURTLE, GREEN SEA	CHELONIA MYDAS	1
TURTLE, HAWKSBILL	ERETMOCHELYS IMBRICATA	1

TURTLE, INDIAN SOFT-SHELLED	LISEMYS PUNCTATA PUNCTATA	1
TURTLE, INDIAN TENT	KACHUGA TECTA TECTA	1
TURTLE, LEATHERY	DERMOCHELYS CORIACEA	1
TURTLE, OLIVE BACK LOGGER HEAD	LEPIDOCHELYS OLIVACEA	1
TURTLE, PEACOCK MARKED SOFT-SHELLED	TRIONYX HURUM	1
TURTLE, THREE KEELED ?	GEOEMYDAS TRICARINATA	4
AMPHIBIANS		
FROGS ##	RANA SPP.	4
NEWT, HIMALAYAN OR SALAMANDAR	TYLOTOTRITON VERRUCOSUS	1
TOADS, VIVIPAROUS ?	MECTOPHYRYNOIDES SPP.	4
CRUSTACEANS		
CRAB, COCONUT OR GIANT ROBBER	BIGRUS LATRO	1

\* This list excludes the insects (primarily butterflies, moths, and beetles) listed in Schedules 1, 2, and 4, as these were too numerous. It also excludes the birds and snakes listed in Schedule 4, as these refer to genera, many of which have several species which would again be too numerous to list. Finally, it altogether excludes Schedule 5, categorised as "vermin" (which now consists only of the common crow, fruit bats, mice, and rats).

The schedules, as they are given in the Act, contain some old generic or specific names, as well as variable spellings. An attempt has been made to update the names, as also to give their standardised spellings, as far as possible, based on the books listed below:

For mammals: Prater, S.H. (1980), and Sterndale, R.A. (1982)

For birds: Ali, S. & Ripley, S.D. (1983)

For reptiles: Daniel, J.C. (1983)

For all of above and amphibians: Hawkins, R.E. (1986)

\$ Amended by Government of India notifications on 29 August, 1977, again on 5th October, 1977, and most recently on 9th September, 1980.

# Includes the Large Indian civet (*Viverra zibetha*), Small Indian civet (*Viverricula indica*), Common palm civet (*Paradoxurus hermaphroditus*), Brown palm civet (*Paradoxurus jerdoni*), and Himalayan palm civet (*Paguma larvata*).

\*\* These are animals whose scientific names could be traced only in Sterndale (1982 reprint) and whose present scientific or common name could not be ascertained.

@ Includes the Common mongoose (*Herpestes edwardsi*), Small Indian mongoose (*H. auropunctatus*), Stripenecked mongoose (*H. vitticollis*), Crab-eating mongoose (*H. urva*), Ruddy mongoose (*H. smithi*), and Brown mongoose (*H. fuscus*).

+ The Act does not specify which vole, nor does it give any scientific name. It is therefore unclear if all or one/some species of voles are being referred to. The four species found within Indian subcontinent limits are: Royle's vole (*Alticola roylei*), Sikkim vole (*Pitymys sikimensis*), Murree vole (*Hyperacrius wynnei*), and Quetta vole (*Ellobius fuscocapillus*).

? These are animals listed in the Act but whose names could not be traced in the references cited above.

## Includes the Indian water skipper frog (*R. cyanopharylyctis*), Bull frog (*R. tigrina*), Short-headed frog (*R. breviceps*), Golden frog (*R. temporaria*), Golden wood frog (*R. aurantiaca*), Corrugated frog (*R. corrugata*), *R. alticola*, *R. hexadactyla*, and *R. crassa*.

## 4. Revised Classification of Indian Forest Types \*

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### I MOIST TROPICAL FORESTS

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#### GROUP 1 TROPICAL WET EVERGREEN FORESTS

##### Sub-group 1A Southern tropical wet evergreen forests

- C1 (Giant evergreen forests)
- C2 Andamans tropical evergreen forest
- E1 (Andamans moist deciduous forests)
- C3 Southern hilltop tropical evergreen forest
- C4 West Coast tropical evergreen forest

##### Sub-group 1B - Northern tropical wet evergreen forest

- C1 Assam Valley tropical wet evergreen forest (*Dipterocarpus*)
- C2 Upper Assam Valley tropical evergreen forest
- C2/(a) Kayea forest
- C2/(b) Mesua forest
- C3 Cachar tropical evergreen forest

*General edaphic and seral types of wet evergreen forests:*

- E1 Cane brakes
- E2 Wet bamboo brakes
- 2S1 Pioneer Euphorbiaceous scrub

#### GROUP 2 TROPICAL SEMI-EVERGREEN FORESTS

##### Sub-group 2A Southern tropical semi-evergreen forests

- C1 Andamans semi-evergreen forest
- C2 West Coast semi-evergreen forest
- C3 Tirunelveli semi-evergreen forest
- 2S1 West Coast secondary evergreen Dipterocarp forest

##### Sub-group 2B Northern tropical semi-evergreen forests

- C1 Assam Valley semi-evergreen forest
- C1/1a Assam alluvial plains semi-evergreen forest
- C1/1b Eastern submontane semi-evergreen forest
- 1S1 Sub-Himalayan light alluvial semi-evergreen forest
- 1S2 *Syzygium* parkland
- 2S1 (Pioneer Euphorbiaceous scrub)
- 2S2 Eastern alluvial secondary semi-evergreen forest
- 2S3 Sub-Himalayan secondary wet mixed forest
- C2 Cachar semi-evergreen forest
- C3 Orissa semi-evergreen forest

\* From Champion and Seth (1968)

*General edaphic and seral types of semi-evergreen forests*

E1	(Cane brakes)
E2	(Wet bamboo brakes)
E3	Moist bamboo brakes
E4	Lateritic semi-evergreen forest
2S1	Secondary moist bamboo brakes

## GROUP 3 TROPICAL MOIST DECIDUOUS FORESTS

## Sub-group 3A Andamans moist deciduous forests

C1	Andamans moist deciduous forest
2S1	Andamans secondary moist deciduous forest

## Sub-group 3B South Indian moist deciduous forests

C1	Moist teak-bearing forest
C1/1a	Very moist teak forest
C1/1b	Moist teak forest
C1/1c	Slightly moist teak forest
C2	Southern moist mixed deciduous forest
2S1	Southern secondary moist mixed deciduous forest

## Sub-group 3C North Indian moist deciduous forests

C1	Very moist sal-bearing forest
C1/1a	Eastern hill sal forest
C1/1a(i)	East Himalayan sal
C1/1a(ii)	Khasi hill sal
C1/1b	Eastern bhabar sal forest
C1/1b(i)	East Himalayan upper bhabar sal
C1/1b(ii)	East Himalayan lower bhabar sal
C1/1c	Eastern tarai sal forest
C1/1d	Peninsular (coastal) sal forest
C2	Moist sal-bearing forest
C2/2a	Moist Siwalik sal forest
C2/2b	Moist bhabar sal forest
C2/2b(i)	Bhabar-dun sal
C2/2b(ii)	Damar sal
C2/2c	Moist tarai sal forest
C2/2d	Moist plains sal forest
C2/2d(i)	Western light alluvium plains sal
C2/2d(ii)	App. Chandar sal
C2/2d(iii)	Eastern heavy alluvium plains sal
C2/2d(iv)	App. Kamrup sal
C2/2e	Moist peninsular sal forest
C2/2e(i)	Moist peninsular high level sal
C2/2e(ii)	Moist peninsular low level sal
C2/2e(iii)	Moist peninsular valley sal
DS1	Moist sal savannah
C3	Moist mixed deciduous forest (without sal)
C3/3a	West Gangetic moist mixed deciduous forest
C3/3b	East Himalayan moist mixed deciduous forest
2S1	Northern secondary moist mixed deciduous forest
2S2	(Secondary Euphorbiaceous scrub)

*General edaphic and seral types of moist deciduous forests*

E1	<i>Terminalia tomentosa</i> forest
1S1	Low alluvial savannah woodland ( <i>Salmania-Albizia</i> )

- 1S2. Eastern hollock forests (*Terminalia myriocarpa*)  
 1S2/2a *Terminalia-Lagerstroemia*  
 1S2/2b *Terminalia-Duabanga*  
 2S1 (Dry bamboo brakes)

#### GROUP 4 LITTORAL AND SWAMP FORESTS

##### Sub-group 4A Littoral forests

- L1 Littoral forest

##### Sub-group 4B Tidal swamp forests

- TS1 Mangrove scrub  
 TS2 Mangrove forest  
 TS3 Saltwater mixed forest (*Heritiera*)  
 TS4 Brackish water mixed forest (*Heritiera*)  
 E1 Palm swamp

##### Sub-group 4C Tropical freshwater swamp forests

- FS1 *Myristica* swamp forest  
 FS2 Submontane hill valley swamp forest  
 FS3 Creeper swamp forest

##### Sub-group 4D Tropical seasonal swamp forests

- SS1 Eastern seasonal swamp forest  
 SS2 *Barringtonia* swamp forest  
 SS3 *Syzygium cumini* swamp low forest  
 SS4 Eastern seasonal swamp low forest (*Cephalanthus*)  
 SS5 Eastern *Dillenia* swamp forest  
 2S1 (*Syzygium* parkland)  
 2S2 (Eastern wet alluvial grassland)

##### Sub-group 4E Tropical riparian fringing forests

- RS1 Riparian fringing forest

## II DRY TROPICAL FORESTS

#### GROUP 5 TROPICAL DRY DECIDUOUS FORESTS

##### Sub-group 5A Southern tropical dry deciduous forests

- C1 Dry teak-bearing forest  
 C1/1a Very dry teak forest  
 C1/1b Dry teak forest  
 C2 Dry red sanders-bearing forest  
 C3 Southern dry mixed deciduous forest

##### Sub-group 5B Northern tropical dry deciduous forests

- C1 Dry sal-bearing forest  
 C1/1a Dry Siwalik sal forest  
 C1/1b Dry plains sal forest  
 C1/1c Dry peninsular sal forest  
 C2 Northern dry mixed deciduous forest

*Degradation stages of tropical dry deciduous forests*

DS1	Dry deciduous scrub
DS2	Dry savannah forest
DS3	( <i>Euphorbia</i> scrub)
DS4	(Dry grassland)

*General edaphic types of dry deciduous forests*

E1	<i>Anogeissus pendula</i> forest
DS1	<i>Anogeissus pendula</i> scrub
E2	<i>Boswellia</i> forest
E3	Babul forest
E4	<i>Hardwickia</i> forest
E5	<i>Butea</i> forest
E6	<i>Aegle</i> forest
E7	Laterite thorn forest
E8	Saline/alkaline scrub savannah
E8/8a	Phoenix savannah
E8/8b	Babul savannah
E8/8c	<i>Salvadora-Tamarix</i> scrub
E9	Dry bamboo brake

*General seral types of dry deciduous forests*

1S1	Dry tropical riverain forest
1S2	Khair-sissu forest
1S3	Inundation babul forest
2S1	Secondary dry deciduous forest

GROUP 6 TROPICAL THORN FOREST

Sub-group 6A Southern tropical thorn forests

C1	Southern thorn forest
C2	Karnatak umbrella thorn forest
DS1	Southern thorn scrub
DS2	Southern <i>Euphorbia</i> scrub

Sub-group 6B Northern tropical thorn forests

C1	Desert thorn forest
C2	Ravine thorn forest
DS1	<i>Zizyphus</i> scrub
DS2	Tropical <i>Euphorbia</i> scrub

*General edaphic, degraded and seral types of thorn forests*

E1	( <i>Euphorbia</i> scrub)
E2	<i>Acacia senegal</i> forest
E3	Rann saline thorn forest
E4	<i>Salvadora</i> scrub
DS1	<i>Cassia auriculata</i> scrub
1S1	Desert dune scrub

GROUP 7 TROPICAL DRY EVERGREEN FORESTS

C1	Tropical dry evergreen forest
DS1	Tropical dry evergreen scrub

### III MONTANE SUBTROPICAL FORESTS

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#### GROUP 8 SUBTROPICAL BROADLEAVED HILL FORESTS

##### Sub-group 8A Southern subtropical broadleaved hill forests

- C1 Nilgiri subtropical hill forest
- DS1 South Indian sub-tropical hill savannah (woodland)
- E1 Reed brakes (*Ochlandra*)
- C2 Western subtropical hill forest
- C3 Central Indian subtropical hill forest
- DS (Degradation stages of Southern subtropical broad leaved hill forests)

##### Sub-group 8B Northern subtropical broadleaved wet hill forests

- C1 East Himalayan subtropical wet hill forest
- C2 Khasi subtropical wet hill forest
- 2S1 (Assam subtropical pine forest)
- DS1 (Assam subtropical hill savannah woodland)

#### GROUP 9 SUBTROPICAL PINE FORESTS

- C1 Himalayan subtropical pine forest
- C1/1a Lower or Siwalik chir pine forest
- C1/1b Upper or Himalayan chir pine forest
- DS1 Himalayan subtropical scrub
- DS2 Subtropical *Euphorbia* scrub
- C2 Assam subtropical pine forests
- DS1 Assam subtropical pine savannah

#### GROUP 10 SUBTROPICAL DRY EVERGREEN FORESTS

- C1 Subtropical dry evergreen forest
- C1/1a *Olea cuspidata* scrub forest
- C1/1b *Acacia modesta* scrub forest
- DS1 *Dodonaea* scrub

### IV MONTANE TEMPERATE FORESTS

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#### GROUP 11 MONTANE WET TEMPERATE FORESTS

##### Subgroup 11A Southern montane wet temperate forests

- C1 Southern montane wet temperate forest
- DS1 Southern montane wet scrub
- DS2 Southern montane wet grassland

##### Sub-group 11B Northern montane wet temperate forests

- C1 East Himalayan wet temperate forests
- C1/1a Lauraceous forest
- C1/1b Buk oak forest
- C1/1c High-level oak forest
- C2 Naga hills wet temperate forests

## GROUP 12 HIMALAYAN MOIST TEMPERATE FORESTS

C1	Lower Western Himalayan temperate forest
C1/1a	Ban oak forest ( <i>Q. incana</i> )
C1/1b	Moru oak forest ( <i>Q. dilatata</i> )
DS1	Oak scrub
C1/1c	Moist deodar forest ( <i>Cedrus</i> )
C1/1d	Western mixed coniferous forest (spruce, blue-pine, silver fir)
C1/1e	Moist temperate deciduous forest
C1/1f	(Low-level blue pine forest ( <i>P. wallichiana</i> ))
DS1	Oak scrub
DS2	Himalayan temperate secondary scrub
C2	Upper West Himalayan temperate forest
C2/2a	Kharsu oak forest ( <i>Q. semecarpifolia</i> )
C2/2b	West Himalayan upper oak/fir forest
C2/2c	(Moist temperate deciduous forest)
C3	East Himalayan moist temperate forest
C3/3a	East Himalayan mixed coniferous forest
C3/3b	<i>Abies delavayi</i> forest

*Degradation stages of Himalayan moist temperate forests*

DS1	Montane bamboo brakes
DS2	Himalayan temperate parkland
DS3	Himalayan temperate pastures

*General edaphic and seral types of Himalayan moist temperate forests*

E1	Cypress forest
1S1	Alder forest
1S2	Riverain blue pine forest
2S1	Low-level blue pine forest

## GROUP 13 HIMALAYAN DRY TEMPERATE FORESTS

(i) *Western types*

C1	Dry broadleaved and coniferous forest ( <i>Quercus ilex</i> - <i>P. gerardiana</i> )
C2	Dry temperate coniferous forest
C2/2a	Neozia pine forest ( <i>P. gerardiana</i> )
C2/2b	Dry deodar forest ( <i>Cedrus</i> )
DS1	Pohu scrub
DS2	Dry temperate scrub
C3	(West Himalayan dry temperate deciduous forest)
C4	West Himalayan high-level dry blue pine forest ( <i>P. wallichiana</i> )
C5	West Himalayan dry juniper forest ( <i>J. macropoda</i> )

(ii) *Eastern type*

C6	East Himalayan dry temperate coniferous forest
E1	Larch forest ( <i>L. griffithiana</i> )
C7	East Himalayan dry juniper/birch forest ( <i>J. wallichiana</i> )

*General seral types of dry temperate forests*

1S1	<i>Hippophae/Myricaria</i> scrub
1S2	<i>Populus/Salix</i> forest
1S3	(Western high-level dry blue pine forest)

## V SUB-ALPINE FORESTS

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### GROUP 14 SUB-ALPINE FORESTS

- |       |  |
|-------|--|
| C1    | West Himalayan sub-alpine birch/fir forests (Betula/Abies) |
| C1/1a | West Himalayan sub-alpine fir forest                       |
| C1/1b | West Himalayan sub-alpine birch/fir forest                 |
| C2    | East Himalayan sub-alpine birch/fir forest                 |

#### *Seral and degraded types of sub-alpine forests*

- |     |   |
|-----|---|
| 1S1 | (Hippophae/Myricaria brakes)                  |
| 1S2 | (Deciduous sub-alpine scrub)                  |
| 2S1 | (Sub-alpine blue pine (P.wallichiana forest)) |
| DS1 | Sub-alpine pastures                           |

## VI ALPINE SCRUB

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### GROUP 15 MOIST ALPINE SCRUB

- |    |                                 |
|----|---------------------------------|
| C1 | Birch/Rhododendron scrub forest |
| C2 | Deciduous alpine scrub          |
| E1 | Dwarf rhododendron scrub        |
| E2 | (Dwarf juniper scrub)           |
| C3 | (Alpine pastures)               |

### GROUP 16 DRY ALPINE SCRUB

- |    |                     |
|----|---------------------|
| C1 | Dry alpine scrub    |
| E1 | Dwarf juniper scrub |

## 5. Government Policies and Programmes Related to Wildlife Conservation in India

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The creation of a network of national parks and sanctuaries is part of a wider effort by the union and state governments to protect India's wildlife. This wider picture includes a set of laws, policies, and guidelines relating to wildlife conservation, as also specific programmes based on these. This chapter deals briefly with some aspects of this broader picture, viz.

- The legal history of wildlife conservation in India
- The special projects undertaken to save wildlife
- The special schemes introduced by the union government to extend financial support to state government efforts at wildlife conservation
- The attempts at establishing a separate and independent wildlife administration in the form of a 'wildlife wing'
- The international conventions and treaties relating to wildlife, signed by India

These are described below.

### 1. LEGAL PROTECTION - A HISTORICAL REVIEW

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Legal protection of wildlife in India is today largely based on The Wild Life (Protection) Act of 1972. But while this was the first nationwide Act dealing specifically with wildlife protection, it had several important forerunners going back over several centuries. These include the edicts of Ashoka, which restricted animal slaughter and protected wildlife throughout his empire, the restrictions on hunting imposed by Jain and Buddhist kings, and the protection of private hunting preserves by several monarchs (Ranjitsinh, undated\*). They also include the religious tenets by which several communities, such as the Bishnois of Rajasthan, set up sacred, protected groves and restricted or completely disallowed animal hunting (Singh, undated).

None of these edicts and tenets were however codified into law. Perhaps the first instance of this is the Elephant Preservation Act

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\* Most of the information for this section on legal protection has been taken from an undated paper by Dr. M.K. Ranjitsinh, Jt. Secretary, Ministry of Environment and Forests, Government of India.

promulgated by the British in 1879. Another single-species legislation was the Bengal Rhinoceros Act, 1932. Amongst the first generalised laws was the Wild Birds and Wild Animals (Protection) Act, 1912. Extending to almost the whole of British India, this Act specified closed hunting seasons and listed animals for whose hunting a license was necessary.

After Independence, several states promulgated their own laws modelled after this Act, e.g., the Bombay Wild Animals and Wild Birds Protection Act, 1951, and similarly titled Acts in Maharashtra, Gujarat, and Goa. The Indian Forest Act 1927 also restricted hunting in areas designated as Reserved or Protected Forests, and made provisions for declaring sanctuaries.

Perhaps the first Act meant exclusively for the protection of wildlife and its habitat was the Hailey National Park Act of UP, under which the Hailey (now Corbett) National Park was set up in 1936. Similar Acts were passed subsequently in Madhya Pradesh, Maharashtra, and Assam.

Meanwhile the Constitution of India included protection of forests and wildlife as duties of the state and the citizen under the Directive Principles of State Policy.

The Wild Life (Protection) Act of 1972 was promulgated out of a long-felt need to have a central legislation dealing not only with hunting but also with the creation of protected areas, and the control of trade in wildlife products. This Act also provides for the establishment of Wildlife Advisory Boards and the appointment of Wildlife Preservation Staff. It further contains certain categories of wildlife, listed in Schedules, according to which several specified animals are completely protected throughout India (Schedule 1), others which are permitted to be hunted only under certain restrictions, and a few which are declared vermin and allowed to be hunted.

The 1972 Act has been accepted by all the states and union territories of India except Jammu and Kashmir. This State has its own Wildlife Protection Act which, however, is essentially similar to the general Act, the major difference being in the list of animals included in the various schedules.

One of the most significant steps towards wildlife conservation in India was the framing of the National Wildlife Action Plan. In 1982 Prime Minister Indira Gandhi outlined a broad framework for wildlife conservation at a meeting of the Indian Board for Wildlife, which consisted of the following:

1. The establishment of a network of protected areas such as national parks, sanctuaries and biosphere reserves to cover representative samples of all major wildlife ecosystems and with adequate geographic distribution.
2. The restoration of degraded habitats to their natural state, within these protected areas
3. The rehabilitation of endangered and threatened species and their restoration to protected portions of their former habitats, in a manner which provides some reflection of their original distribution.

4. The provision of adequate protection to wildlife in multiple use areas (such as production forests and pasture lands) so as to form 'corridors' linking up the protected areas and providing for genetic continuity between them.
5. Support for the management of botanical gardens and zoological parks and undertaking captive breeding programmes for threatened species of plants and animals.
6. The development of appropriate management systems for protected areas, including a professional cadre of personnel fully trained in all aspects of wildlife and sanctuary management; as well as the provision of proper orientation to all officers concerned with wildlife.
7. The development of research and monitoring facilities which will provide a scientific understanding of wildlife populations and habitats essential to their proper management.
8. Support for wildlife education and interpretation aimed at a wider public appreciation of the importance of wildlife to human betterment.
9. The review and updating of statutory provisions, providing protection to wildlife and regulating all forms of trade, so as to ensure their current effectiveness.
10. Assistance in the formulation and adoption of a National Conservation Strategy for all living natural resources on the lines of the World Conservation Strategy launched in 1980.
11. Participation in International Conventions designed to prevent the depletion of the wildlife resources and to provide protection to migratory species.
12. Long-term conservation of wildlife based on the scientific principles of evolution and genetics. (Singh, 1983)

Based on the above, the National Action Plan was formulated, consisting mainly of the following objectives:

- (a) Establishment of a Representative Network of Protected Areas.
- (b) Management of Protected Areas and Habitat Restoration
- (c) Wildlife Protection in Multiple Use Areas
- (d) Rehabilitation of Endangered and Threatened Species
- (e) Captive Breeding Programmes
- (f) Wildlife Education and Interpretation
- (g) Research and Monitoring
- (h) Domestic Legislation and International Conventions
- (i) National Conservation Strategy
- (j) Collaboration with Voluntary Bodies/Non-Government Organisations

## 2. SPECIAL CONSERVATION PROGRAMMES

Apart from efforts at protecting wildlife generally throughout India, by the promulgation of the Wild Life (Protection) Act and the creation of national parks and sanctuaries, the central and state governments have also initiated some special programmes aimed at preserving certain endangered species. The best-known of these is Project Tiger, but there are also others like Project Hangul; Crocodile Breeding Project; Gir Lion Sanctuary Project; Himalayan Musk Deer Project; and Manipur Brow-Antlered Deer Conservation Project.

### Project Tiger

Alarmed at the drastic decline in the number of Bengal Tigers (*Panthera tigris*) from an estimated 40,000 at the turn of the century to less than 2000 in 1972, the

Government of India decided to take special measures to rehabilitate its population. Already in 1970 a ban on tiger hunting had been imposed, and the stage was further set by the Wild Life Act 1972. Thus in 1973 was launched Project Tiger, one of the largest and most ambitious single-species conservation projects ever undertaken. The Indian Board for Wildlife, which planned the Project, put this as its major objective:

To ensure maintenance of a viable population of tigers in India and to preserve, for all time, areas of biological importance as a national heritage for the benefit, education, and enjoyment of the people (Department of Environment, undated-a\*).

The way in which this was to be done was emphasised by the then P.M. Indira Gandhi in the following words:

The tiger cannot be preserved in isolation. It is at the apex of a large and complex biotope. Its habitat, threatened by human intrusion, commercial forestry and cattle grazing, must first be made inviolate. (Department of Environment, undated-a)

Nine tiger reserves were established in various parts of the country in 1973-74, with financial and material support of World Wildlife Fund. 8 more have been added subsequently, 2 in 1979, 4 in 1983, and 2 in 1987-88. The total area so far covered under Project Tiger is 26,00,229 ha. What is crucial is that the 17 tiger reserves represent a wide variety of biogeographic types, or habitats. Table 1 lists these reserves along with the dominant habitat found in them, and their area in hectares.

It is significant that many of the tiger reserves have been declared not only because of their tiger populations but also because they harbour other rare and endangered species. Thus, for example, Indravati is one of the last homes of the wild buffalo in Central India; Namdapha is the only reserve to have 4 big cats (tiger, leopard, clouded leopard and snow leopard) and is also an ideal habitat for the Hoolock gibbon, Slow loris, Red panda, Binturong and a significant diversity of orchids; Manas harbours the Golden langur, Pygmy hog and Hispid hare.

The basic scheme of operation in these reserves has been to demarcate a 'core' area free of almost all human activities, and a 'buffer' where restricted human land use is allowed. Of the 26,00,229 ha under the project till 1987, 9,66,929 ha was thus designated as 'core'. The management of the reserves concentrates on three aspects:

- (a) Elimination of human disturbance in the core and restriction of human activities in the buffer to those which are harmonious with conservation objectives;

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\* The information for this section on Project Tiger has mostly been taken from this document.

- (b) Habitat management only to the extent of restoring areas disturbed earlier by human activity; and
- (c) Intensive research and monitoring of wildlife.

With these objectives in mind the Government of India and the state governments have, in the last one-and-a-half decades, given top priority to tiger reserves.

These reserves are by now amongst the best equipped, best staffed, and most heavily funded wildlife areas in India. All of them have detailed management plans, a rarity in India, and separate budgets, as also relatively highly developed management practices and tourist facilities. Most significantly, these are the areas which have seen the maximum effort at reducing human interference, especially in the core areas, by shifting human settlements out, banning commercial forestry and grazing, and properly managing tourism.

Table 1

<i>Tiger Reserve/State</i>	<i>Habitat Type</i>	<i>Area (ha)</i>
<b>1973-74</b>		
1. Bandipur National Park/Karnataka	Dry to moist deciduous forests, in the rain shadow area of Western Ghats	86,600
2. Corbett National Park/UP	Moist deciduous sal forests of the Siwalik foothills	52,000
3. Kanha National Park/MP	Moist deciduous sal & bamboo, forests of the central Indian highlands	194,500
4. Manas Sanctuary/Assam	Semi-evergreen & evergreen forests & terai swamps of the East Himalayan foothills	2,84,000
5. Melghat Sanctuary/Maharashtra	Deciduous teak & bamboo forests	1,59,700
6. Palamau National Park/Bihar	Dry & moist deciduous forests of sal & bamboo, in the eastern peninsula	93,000
7. Ranthambore National Park/Rajasthan	Dry deciduous forests of the Aravalli & Vindhya Ranges	82,500
8. Simlipal National Park/Orissa	Hilly moist deciduous & semi-evergreen forests	2,75,000
9. Sunderbans National Park/West Bengal	Estuarine mangrove & littoral forests & marshland	2,58,500
<b>1979</b>		
10. Periyar National Park/Kerala	Moist deciduous to wet evergreen forests	77,700
11. Sariska National Park/Rajasthan	Dry deciduous forests of the Aravalli Range	80,000

1983		
12.	Buxa Sanctuary / West Bengal	Riverain & swampy area with semi- evergreen forests of the East Himalayan foothills 74,500
13.	Indravati National Park/MP	Moist deciduous forests of teak & bamboo in the great central forest belt 2,79,900
14.	Nagarjunasagar Sanctuary/AP	Dry deciduous forests 3,56,800
15.	Namdapha National Park/Arunachal Pradesh	Wet evergreen to alpine forests in a habitat ranging from 200 m. to 4500m. above msl 1,98,500
1987-88		
16.	Dudhwa National Park/UP	Moist deciduous forests, grasslands, and swamps of the terai region 49,029
17.	Kalakad- Mundanthurai Sanctuaries/TN	Evergreen and semi-evergreen forests of the southern-most tip of the Western Ghats 80,000

Sources : Department of Environment, undated-a; Project Tiger Office (Pers. Comm.)

The results are quite visible. Natural regeneration in the form of vegetational recovery and drastic improvement in water resources have been marked. Particularly impressive has been the reported rise in tiger population, from 268 in 1972 in 9 reserves to 854 in 1983 in 11 reserves. With four more reserves added in 1983, the tiger population estimated in 1987 under the project was 1221 (Ministry of Environment and Forests, 1987). Since then, in 1987-88, two more reserves have been declared. Overall, floral and faunal diversity appears to have shown a marked improvement, and several endangered species, apart from the tiger, have benefited considerably.

More recently the achievements of Project Tiger have been clouded somewhat by some controversies related to tiger reserves. One of these relates to the phenomenon of man-eating. Dudhwa National Park and Sunderbans National Park are infamous for this — as the former Director of the Wildlife Institute of India Shri V.B. Saharia notes

It is believed that all Sunderbans tigers are man-eaters and every year, a large number of fishermen, honey-collectors, and other villagers fall prey to these tigers (Saharia, 1981).

Simultaneously villagers in these and other reserves have often had to face

depredations from wild animals particularly crop-raiding by the larger ungulates ..... and cattle-lifting and even man-eating by predators like the tiger and the panther" (Department of Environment, 1983).

Due to such factors hostility has built up among local villagers and it would be necessary in future to incorporate local human needs with conservation needs.

### Project Hangul

Hangul, or Kashmir stag (*Cervus elaphus hanglu*), is one of India's most endangered deer species. Estimated to number 3000 in 1940, it declined to a mere 140-170 in 1970 (Saharia 1981)\*. Alarmed at this revelation, the Governments of India and Jammu and Kashmir, helped by the International Union for the Conservation of Nature and Natural Resources, and the World Wildlife Fund, launched a major conservation effort in 1970. The major inputs in the earlier stages were research and monitoring; subsequently conservation steps were taken up in Dachigam Sanctuary, the main stronghold of Hangul. Poaching has been substantially reduced by intensified patrolling, wood cutting has been banned, and most nomads removed. Dachigam was upgraded to a national park in 1981, giving the Hangul habitat further protection. Additional measures like disease prevention and fire control have also been taken up under the Project. In 1980 the number of Hangul was estimated at 347. In 1985, Dachigam Park authorities reported a figure of 554 (Indian Institute of Public Administration, 1984), and the March 1987 figure was 810 (Ministry of Environment and Forests, 1987). If these figures are any indication, Project Hangul seems to have succeeded admirably at Dachigam National Park.

### Crocodile Breeding Project

By the mid-70's the population of all three crocodilian species found in India — Freshwater crocodile (*Crocodylus palustris*), Saltwater crocodile (*Crocodylus porosus*), and Gangetic gharial (*Gavialis gangeticus*), had declined to ominously low levels. Though exact estimates were difficult to make, it was felt that they were on the verge of extinction. Hence in 1974, following some studies of their status, help was sought from the FAO. In 1975 Project Crocodile Breeding and Management was officially launched as a joint Government of India/FAO/UNDP effort.

The action plan carried out included locating the best remaining crocodile habitats and their protection through declaration of sanctuaries and national parks, collection of eggs from the wild and their incubation in protected hatcheries, captive breeding of crocodiles and their release into the wild, and conducting the research and training necessary for all these activities.

Till 1980, 11 sanctuaries were declared specially for crocodile protection, including the tri-state National Chambal Sanctuary, one of the largest in India. Also, by then, over 2600 crocodiles of all 3 species had been hatched at about 16 rearing centres, of which some 1000 had been released into the wild. A

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\* The information for this and all the subsequent parts of this section has been taken from this document, except where stated.

Central Crocodile Breeding and Management Institute was set up at Hyderabad for training personnel. Since 1980 five more sanctuaries have been set up with crocodiles as the main species to be protected, and the number of rearing centres is now 8 for Gharials, 18 for Freshwater crocodiles, and 5 for Saltwater crocodiles (Ministry of Environment and Forests, 1987).

Like Project Tiger, Project Crocodile's impressive success has been marred lately by complaints of a negative impact on local fisheries, especially in and around the sanctuaries where the crocodiles have been released. Harmonising local fisheries with crocodile conservation and augmentation is thus now a major challenge.

### Gir Lion Sanctuary Project

Of all the large cats which have been threatened by human activities, the Asiatic lion (*Panthera leo persica*) probably came closest to extinction. Just 15 were left at the turn of this century in the Gir forests of Gujarat, inhabiting a minute portion of their previously wide-ranging habitat. Fortunately further shooting of lions was stopped by the ruler of the area, (reportedly by pretending to would-be hunters of the British Administration and of royal families that no more lions existed). Their number subsequently rose, though slowly. New threats in the form of habitat destruction by agricultural extension and grazing prevented a more rapid recovery.

The lion's critical status was recognized at an IUCN meeting in 1969, and in 1972 the Government of Gujarat started a lion protection scheme. It issued guidelines to implement the twin goals of lion habitat conservation and socio-economic upliftment of the Maldhari nomads who were dependent on the same ecosystem. The Gir Sanctuary, the sole area left with lions, was extended in 1974 and then upgraded to a national park in 1975. A peripheral rubble wall was built all along the park boundary, to keep outside cattle from grazing inside. Simultaneously the Maldharis began to be resettled; by now most of them have been relocated.

The consequent improvement in habitat was beneficial to several species of wildlife. The lion population itself is reported to have increased from 180 in 1974 to 205 in 1979. In 1985 it was estimated at 239 (Ministry of Environment and Forests, 1987).

### Himalayan Musk Deer —Ecology and Conservation Project

The male of the Musk deer (*Moschus moschiferus*) is unfortunate in having a gland of highly fragrant musk, for this endowment has nearly caused its extinction. Musk today sells at several times its weight in gold, and is used in cosmetics and medicines. Poaching and habitat destruction had pushed the Musk deer to the edge, when a project to conserve it was launched. This

included offering it protection by declaring national parks and sanctuaries in its prime habitat areas. Also initiated was a musk deer farming and musk extraction scheme to try and counter illegal trade in musk, and perhaps also to restock the deer into the wild. Central assistance for this has been extended to Himachal Pradesh and Jammu and Kashmir in 1987-88 (Ministry of Environment and Forests, 1987). Such restocking has however not yet been taken up. In addition poaching and habitat destruction continue to be serious threats to the Musk deer.

#### Manipur Brow-antlered Deer Conservation Project

The Manipur brow-antlered or Thamin deer (*Cervus eldi eldi*) has for a long time been perhaps the most endangered deer sub-species in the world. In fact by 1950 it was regarded as extinct until a small population was discovered at a place called Keibul Lamjao on Logtak Lake in Manipur. Realising the importance of the area for the preservation of this deer, it was declared a sanctuary in 1954. But many of the threats to the deer and its unique floating habitat ('phumdi'), like grass cutting, grazing, fishing, and poaching, remained prevalent until the area was upgraded to a National Park in 1977. With this many of these activities have been banned, though at a lesser level they still continue illegally.

Central government financing to this project (started in 1973) has gone into acquiring of land (farms) within the park, construction of a fence along the park's borders, digging of a cattle-proof trench, purchase of canoes for patrolling, construction of a captive breeding enclosure in Manipur Zoo, and hiring of a helicopter for census operations. The state government has recently added considerably to the staff stationed at the park, with a full-time assistant conservator of forests in charge.

An aerial census carried out in 1977 put the Thamin deer population at 18, 2 more than the 1975 estimate. The ZSI put the figure in 1979 at 30. In March 1986, as many as 95 were reportedly sighted, but in another aerial survey in April 1987, only 35 were spotted (Ministry of Environment and Forests, 1987).

It is now felt that apart from intensified measures to check illegal activities, and greater research to understand the complex 'phumdi' ecosystem, it is necessary to establish a second home for the Thamin deer. This could be done by releasing captive-bred deer from the Delhi, Calcutta, or Manipur zoos. The process for implementing this has started, and reportedly a feasibility study has been conducted and an area identified where the deer could be released.

### 3. CENTRAL FINANCIAL ASSISTANCE FOR NATIONAL PARKS AND SANCTUARIES

Under the Wildlife Protection Act 1972, the creation and maintenance of national parks and sanctuaries is in the hands of state governments, with the exception of parks and sanctuaries set up and controlled by the union government (of which there are none so far). This means that the financial allocations for wildlife protection have to be from state funds.

However, the central government has various schemes under which it can extend financial support to states. These schemes, and the pattern of present (1986-87) financial assistance under each are given below.

#### A. Development of National Parks

Central funding of 100% of expenditure on approved non-recurring items, and 50% of approved recurring expenditure would be given (Kishore, 1987-a). This assistance is subject to an undertaking that the state governments will not reduce the existing level of their own financial outlay (both recurring and non-recurring) on these parks, and further that these parks are in the full control of the state wildlife wing. There are further conditions (Kishore, 1987-a):

- (i) The parks for which assistance is sought should be notified and fully constituted under the Wildlife (Protection) Act, 1972.
- (ii) The state would provide for trained man-power management of the parks.
- (iii) Detailed management plans would be prepared for these parks and their buffer areas.
- (iv) No forest working would be allowed in the Parks.
- (v) The advice of the Director, Wildlife Preservation, Government of India, would be followed in matters relating to Park management and implementation of this scheme.

#### B. Development of Sanctuaries

Central assistance on 100% basis on selected non-recurring items of expenditure would be given (Kishore, 1987-b). Assistance is subject to an undertaking from the states that they will not reduce their own expenditure on non-recurring items in the previous year on the sanctuaries for which assistance is sought, and further that these sanctuaries would be fully under the control of the Wildlife Wing (Kishore, 1987-b). Further conditions imposed are that:

- (i) The sanctuaries for which assistance is sought should have been notified under appropriate legislation.

- (ii) The present boundaries of these sanctuaries would not be changed to reduce the present area.
- (iii) The state government must accept responsibility and financial commitment for all the recurring expenditure on these sanctuaries, and must continue work after the period of central assistance has expired.
- (iv) Commercial forestry operations of any form must be completely stopped.
- (v) A task force committee consisting of state and central government representatives must be established for each project to monitor the development of the scheme.
- (vi) Conservation and management plans for these sanctuaries should be prepared.

#### C. For Tiger Reserves Under Project Tiger

Here it is the same as for national parks — 100% central assistance on identified items of non-recurring expenditure, and 50% on recurring expenditure. The status of this scheme is somewhat different from the above two — since it is a centrally-administered project, states do not apply for funding but are given funds on the basis of recommendations of the Project Tiger authorities in the Ministry of Environment and Forests, Government of India. For this purpose detailed guidelines were formulated in 1973 (Government of India, 1973) and sent to all the states concerned.

#### D. Other Schemes

Apart from the above schemes, there are also funding offers from the central government to the states, e.g., for the setting up of zoos, for captive breeding and rehabilitation of endangered species, for control of poaching and illegal trade in wildlife, and for nature education and interpretation programmes.

#### E. Financial Outlay

The Seventh Plan outlay for the above schemes is as follows (Ranjitsinh, 1987):

1. Development of National Parks	Rs. 2.60 crore
2. Development of Sanctuaries	Rs. 3.06 crore
3. Project Tiger	Rs. 10.60 crore
4. Captive Breeding & Rehabilitation	Rs. 1.10 crore
5. Development of Zoos	Rs. 1.60 crore
6. Wildlife Education & Interpretation	Rs. 1.10 crore
7. Control of Poaching & Illegal Trade	Rs. 1.10 crore

In the period 1984 to 1987, 23 states and union territories have asked for financial assistance for over 160 national parks and sanctuaries (Government of India, 1986). In 1985-86, 19 states and union territories asked for assistance for

83 parks and sanctuaries — of these, the centre released funds for 64 parks and sanctuaries. The total amount released was Rs. 2.7 crore, the total requested having been Rs. 6.55 crore.

#### 4. ESTABLISHMENT OF SEPARATE WILDLIFE WING

It has long been felt that the control and management of wildlife sanctuaries and national parks should be in the hands of a specialised government agency. The prevalent situation of wildlife management being just one of the many things handled by the Forest Department was felt to be unsatisfactory, especially as it was seen that wildlife conservation was rarely given high priority in such a set-up. Hence the central government has for over a decade now been requesting the states to establish separate Wildlife Wings whose sole function would be wildlife conservation and management.

Guidelines and instructions on this matter have been issued by the central government since 1973. The then Prime Minister Indira Gandhi, in a letter dated December 27, 1973 had suggested the

creation of Wildlife Department under the Forest Department at the Government level in those states which have large and important areas of wildlife. In other states, there may be a separate Wildlife Wing under the Chief Conservator of Forests. (Prime Minister of India, 1973)

Sometime in 1975 guidelines on this were sent out to all states and union territories (Jayal 1976). These guidelines (Government of India, undated) specified that the management of wildlife sanctuaries and parks must be in the hands of the Wildlife Wing, which was to be headed by a Chief Wildlife Warden of the rank of Additional Chief Conservator of Forests, or Conservator of Forests. They further specified that each park or sanctuary over 250 sq km in area should have a Deputy Chief Wildlife Warden of the rank of Deputy Conservator of Forests in-charge; each park or sanctuary between 100 and 250 sq km in area should have in charge of it, a Wildlife Warden of the status of Assistant Conservator of Forests; and each park or sanctuary between 50 and 100 sq km in area should be under the control of an Assistant Wildlife Warden of the rank of a Ranger. There were further specifications about the setting up of manned checkposts and other such operational activities.

It is quite evident that progress in implementing these guidelines by the states was till recently extremely tardy. This has been noted repeatedly in letters sent by the central government to the state governments (Singh, 1981), and has even prompted the centre to threaten a cessation of financial assistance to states which have not put their parks and sanctuaries under a Wildlife Wing (Jayal, 1976). A review by the Indian Board for Wildlife in February 1981 revealed that 'only 13 states had set up Wildlife Wings of sorts', and

further that even in these states 'the manning and working of these new Wildlife Wings... leaves much to be desired'. (Singh, 1981).

There appears to have been substantial improvement in the situation since then. All states and union territories which have national parks and sanctuaries, now have Wildlife Wings. This does not, however, mean that these wings have control over all the parks and sanctuaries in each state. Indeed three states — Andhra Pradesh, Punjab and Tamil Nadu — have not transferred control over any park or sanctuary to the Wildlife Wing (S.C. Sharma, Ministry of Environment, Pers. Comm., 1987). Eight others — Bihar, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Uttar Pradesh, and West Bengal — have done such a transfer for a part of their parks and sanctuaries, not all (S.C. Sharma, Ministry of Environment, Pers. Comm., 1987). In the remaining states, transfer has been complete.

## 5. INTERNATIONAL CONVENTIONS AND TREATIES

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The last two decades have seen an increasing recognition of the fact that effective wildlife protection is often not possible without active international cooperation. This is for several reasons, including the fact that many wild animals migrate across the boundaries of several nations, as also the painful reality of a thriving international trade in wildlife products.

Several conventions and treaties relating to wildlife conservation have been proposed and accepted by the international community. India too is a signatory to some of them, including the following:

- Convention on Wetlands of International Importance Especially as Waterfowl Habitat, adopted in Ramsar, Iran, February 1971; for the purpose of preserving certain types of ecosystems together with the waterfowl species that are ecologically dependent on these ecosystems (Convention, 1971).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), signed in Washington on March 3, 1973, and brought into effect on July 1, 1975; to protect those species being commercially exploited through international trade (Convention, 1973).
- Convention on the Conservation of Migratory Species of Wild Animals, signed by 50 countries in Bonn in 1979 and effective from 1 September, 1983; for the protection of species inhabiting international waters or those which migrate from one country to another (Convention, 1979).
- Convention between India and the Soviet Union for the protection of migratory birds, signed in 1984 (Convention, 1984).

## 6. Expenditure on Parks and Sanctuaries as a Proportion of Expenditure of the Forest Department

STATE +	1982-83			1983-84		
	FOREST DEPT. EXPEND- ITURE (RUPEES IN LAKHS)	PARKS & SANCTUARIES EXPENDITURE (RUPEES IN LAKHS)	EXPENDITURE ON PARKS & SANCTUARIES AS PERCENTAGE OF THE FOREST DEPT. EXPENDITURE	FOREST DEPT. EXPEND- ITURE (RUPEES IN LAKHS)	PARKS & SANCTUARIES EXPENDITURE (RUPEES IN LAKHS)	EXPENDITURE ON PARKS & SANCTUARIES AS PERCENTAGE OF THE FOREST DEPT. EXPENDITURE
AP	2088.632	18.693	0.89%	2554.467	42.347	1.66%
ARU	475.930	0.635	0.13%	650.890	3.974	0.61%
BIH	1884.020	39.170	2.08%	2171.987	38.980	1.80%
GOA	126.491	11.700#	9.25%	157.611	14.681#	9.31%
HAR	947.610	4.500	0.47%	1050.930	4.137	0.39%
HP	2009.360	16.570	0.82%	2150.260	17.630	0.82%
KAR	2849.134	36.839	1.29%	3386.283	50.370	1.49%
KER	1311.710	39.520	3.01%	1605.060	37.100	2.31%
MAH	4132.780	74.510	1.80%	4122.290	86.438	2.10%
MAN	180.310	5.400	2.99%	222.550	2.934	1.32%
MEG	144.850	19.310	13.33%@	168.600	23.732	14.08%@
MP	12423.137	197.060	1.59%	13760.668	269.730	1.96%
ORI	1316.430	61.850	4.70%	1186.130	82.270	6.94%
RAJ	1531.670	71.380*	4.66%	1829.520	74.860*	4.09%
SIK	194.980	11.011	5.65%	253.430	3.086	1.22%
TN	1558.600	71.530	4.59%	2050.370	80.723	3.94%
WB	2572.220	96.950	3.77%	2913.310	102.560	3.52%
	35747.863	776.628	2.17%	40225.356	935.552	2.33%

Source : Indian Institute of Public Administration, 1984a (All figures rounded off.)

+ Figures for Nagaland, Gujarat, Jammu and Kashmir, and Uttar Pradesh were not available.

# Of the total, an amount of Rs 8,02,450 in 1982-83 and Rs 8,89,942 in 1983-84 were spent on developing tourist facilities.

@ In Meghalaya the Forest Department has control over a very small percentage of the State's forests. The rest of the forests are under the District Councils. Therefore the forest budget is relatively small.

\* Does not include money paid to territorial division for maintenance etc. of 11 sanctuaries.

Note : The Indian Board for Wildlife has recommended, in September, 1985, that 15% of the State forest budget be earmarked for wildlife management.

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# TABLES

## NOTES ON THE TABLES

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### Time Frame

Data presented in the tables are for the period April 1, 1979 to March 31, 1984, unless otherwise specified.

### Blanks

Blanks within the tables indicate that the information is not available, or is irrelevant.

### Abbreviations used

A&N	:	Andaman and Nicobar
AP	:	Andhra Pradesh
Aru	:	Arunachal Pradesh
Ave/Avg	:	Average
Bih	:	Bihar
BZ	:	Buffer Zone
Guj	:	Gujarat
Har	:	Haryana
HP	:	Himachal Pradesh
J&K	:	Jammu and Kashmir
Kar	:	Karnataka
Ker	:	Kerala
Mah	:	Maharashtra
Man	:	Manipur
Meg	:	Meghalaya
MP	:	Madhya Pradesh
N.A.	:	Not available
Nag	:	Nagaland
No./Nos.	:	Number(s)
N/S	:	National Parks / Sanctuaries
Ori	:	Orissa
Raj	:	Rajasthan
Sik	:	Sikkim
S&T	:	Sanctuaries and Total (for states and union territories with no national parks)
T	:	Total
TN	:	Tamil Nadu
UP	:	Uttar Pradesh
UT	:	Union Territory
WB	:	West Bengal

Table I:1 Legal Steps (Extended Database)

N/S	Legal steps taken *												
	1	2	3	4	5	6	7	8	9	10	11	12	13
A&N/N/MAR		Y							I	N	N	N	N
A&N/N/MID		Y	N	N	N	N	N	N	I	N	N	N	N
A&N/N/MOU		Y	N	N	N	N	N	N	N	N	N	N	N
A&N/N/NOR		Y	N	N	N	N	N	N	N	N	N	N	N
A&N/N/SAD		Y	N	N	N	N	N	N	N	N	N	N	N
A&N/N/SOU		Y	N	N	N	N	N	N	N	N	N	N	N
A&N/S/BAT	Y		N	N	N	N	N	N	I	I	I	I	
A&N/S/CRO	Y												
A&N/S/INT	Y		N	N	N	N	N	N	N	N	N	N	
A&N/S/MEG	Y		N	N	N	N	N	N	N	N	N	N	
A&N/S/NAR	Y		N	N	N	N	N	N	N	N	N	N	
A&N/S/NOR	Y		N	N	N	N	N	N	N	N	N	N	
A&N/S/SOU	Y												
A&N/S/TIL	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/COR	Y							N	N	N	N	N	
AP/S/ETU	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/KAW	Y												
AP/S/KIN	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/KOL	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/MAN	Y									Y	N	N	
AP/S/NAG	Y		Y	N	N	N	N	N	N	N	N	N	
AP/S/NEE	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/PAK	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/PAP	Y		N					N			N	N	
AP/S/POC	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/PRA	Y												
AP/S/PUL	Y		N	N	N	N	N	N	N	N	N	N	
AP/S/SIW	Y									Y	N	N	
ARU/N/NAM		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ARU/S/ITA	Y		Y	Y	Y		N	Y	N	N	N		
ARU/S/LAL	Y		N	N	N	N	N	N	N	N	N	N	
ARU/S/MEH	Y												
ARU/S/PAK	Y		N	N	N	N	N	N	N	N	Y	N	
BIH/S/BHI	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/DAL	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/GAU	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/HAZ	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/LAW	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/PAL	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/RAJ	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/TOP	Y		N	N	N	N	N	N	N	N	N	N	
BIH/S/VAL	Y		N	N	N	N	N	N	N	N	N	N	
CHA/S/SUK	Y												
GOA/N/BHA		Y	Y		N			Y	N	N	N	N	N
GOA/S/BHA	Y		Y		N			Y	N	N	N	N	N
GOA/S/BON	Y		N	N	N	N	N	Y	N	N	N	N	N
GOA/S/COT	Y		N	Y	N	N	N	Y	N	N	N	N	N
GUJ/N/BAN		Y	Y	Y		N	N	N	N	N	N	N	Y

Table I:1 (contd)

N/S	Legal steps taken *												
	1	2	3	4	5	6	7	8	9	10	11	12	13
GUJ/N/GIR	Y+	Y	Y										Y
GUJ/N/MAR	Y+	Y	Y	Y	N	N	Y	Y	N	N	N	Y	Y
GUJ/N/VEL	Y+	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y
GUJ/S/BAR	Y		N	N	N	N	N	N	N	N	N	N	
GUJ/S/DHR	Y		Y	N	N	N	N	N	N	N	N	N	
GUJ/S/DUM	Y		N	N	N	N	N	N	N	N	N	N	
GUJ/S/HIN	Y		Y	Y	Y	I	I						
GUJ/S/JES	Y				Y	N	N	N	I	I	I	I	
GUJ/S/KHI	Y		Y	Y	N	N		Y					
GUJ/S/NAL	Y		Y	Y	Y	Y	I	N	N	N	N	N	
GUJ/S/NAR	Y		N	N	N	N	N	N	N	N	N	N	
GUJ/S/RAT	Y		N	N	N	N	N	N	N	N	N	N	
HAR/S/SUL	Y										Y		
HP/N/GRE	Y+	Y	N	N	N	N	N	N	N	N	N	N	N
HP/N/PIN		Y	N		N	N	N	Y	N	N	N	N	N
HP/S/BAN	Y		Y			Y							
HP/S/CHA	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/DARA	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/DARL	Y		N	N	N	N	N	N	N	N			
HP/S/GAM	Y												
HP/S/GOB	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/KAI	Y		N	N	N	N	N	N					
HP/S/KAL	Y												
HP/S/KAN	Y		N	N	N	N	N	N		N		N	
HP/S/KHO	Y		N	N	N	N		N		N	N	N	
HP/S/KUG	Y												
HP/S/LIP	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/MAJ	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/MAN	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/NAI	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/NAR	Y		Y			Y							
HP/S/PON	Y												
HP/S/RAK	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/REN	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/RUP	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/SEC	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/SHIK	Y		Y			Y							
HP/S/SHIL	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/SHIM	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/SIM	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/TAL	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/TIR	Y		N	N	N	N	N	N	N	N	N	N	
HP/S/TUN	Y												
J&K/N/DAC	Y+	Y	Y						N	N			Y
J&K/N/HEM		Y	Y	Y	Y	Y	N	N	N	N	N	N	Y
J&K/N/KIS		Y	Y	Y	N	N	N	N	N	N	N	N	N
J&K/S/JAS	Y		N	N	N	N	N	N	N	N	N	N	
J&K/S/LUN	Y							N	N	N	N	N	

Table I:1 (contd)

[illegible]

Table I:1 (contd)

[illegible]

Table I:1 (contd)

[illegible]

Table I:1 (contd)

N/S	Legal steps taken *												
	1	2	3	4	5	6	7	8	9	10	11	12	13
UP/N/DUD	Y+	Y	Y	Y	Y	Y	I	N	N	N	N	I	Y
UP/N/NAN		Y	Y	Y	Y	Y		Y	I	I	I	I	Y
UP/N/VAL		Y	Y	Y	Y	Y	N		I	I	I	I	Y
UP/S/CHA	Y		N	N	N	N	N	N	N	N	N	N	
UP/S/CHI	Y		Y	Y	N	N		N					
UP/S/GOV	Y		N	N	N	N	N	N	N	N	N	N	
UP/S/KAI	Y												
UP/S/KAT	Y		N	N	N	N	N	N	N	N	N	N	
UP/S/KED	Y		N	N	N	N	N	N	N	N	N	N	
UP/S/KIS	Y							N	N	N	N	N	
UP/S/MAH	Y		N	N	N	N	N	N	N	N	N	N	
UP/S/MOT	Y		Y	N	N	N	N	N	N	N	N	N	
UP/S/NAT	Y		N	N	N	N	N	N	N	N	N	N	
UP/S/NAW	Y												
UP/S/RAJ	Y		Y	Y	N	N	N	Y	N	N	N	N	
UP/S/RAN	Y		N	N	N	N	N	N	N	N	N	N	
WB/N/SUN	Y#	Y				Y							Y
WB/S/BAL	Y		N	N	N	N	N	N	N	N	N	N	
WB/S/JAL	Y		N	N	N	N	N	N	N	N	N	N	
WB/S/RAM	Y												
WB/S/SAJ	Y												

\* The 13 steps in the legal procedure for setting up a national park or sanctuary are as follows (with the relevant section of the Wild Life (Protection) Act 1972 in brackets):

Step 1: Declared a Sanctuary, by notification (18)

Step 2: The intention declared to constitute it into a National Park, by notification (35.1)

Step 3: Proclamation issued by the Collector (21)

Step 4: Commencement of enquiry by the Collector, into claims preferred/otherwise existent (22)

Step 5: Completion of such an enquiry

Step 6: Passing of order, by Collector, admitting or rejecting claims (24.1)

Step 7: Ordering the exclusion, from National Park/Sanctuary, of any of the portions for which claims have been admitted (24.2.a)

Step 8: Appointment of Settlement Officer

Step 9: Execution of agreements between the government and owner(s) of such lands/rights which are to be included in the National Park/Sanctuary and for which claims have been admitted (24.2.b)

Step 10: Initiation of acquisition procedures for lands/rights which are to be included in the National Park/Sanctuary and for which claims have been admitted (24.2.b)

Step 11: Completion of acquisition procedures

Step 12: Settling of appeals, if any

Step 13: Issuing of final notification for Park (35.4)

Y = Yes; N = No

I = Reported as irrelevant or inapplicable

+ National park area was earlier a sanctuary, wholly or in part

# Reported to have taken step of declaration of sanctuary, but from data available it is unclear if this was earlier a sanctuary

Table I:2 Alteration of Boundaries

1		2	3	4	5	6	7
State/ U.T.		Total N/S	N/S responding	N/S with alteration	4 as % of 3	N/S with addition	N/S with deletion
A&N	N	6	2	0	0		
	S	5	4	0	0		
	T	11	6	0	0		
AP	S & T	15	13	0	0		
Aru	N	1	1	0	0		
	S	4	4	0	0		
	T	5	5	0	0		
Bih	S & T	13	9	0	0		
Goa	N	1	1	0	100		1
	S	3	3	1	33		1
	T	4	4	2	50		2
Guj	N	4	3	2	67	2	*1
	S	12	10	2	20	1	1
	T	16	13	4	31	3	2
Har	S & T	1	1	0	0		
HP	N	1	1	0	0		
	S	29	20	0	0		
	T	30	21	0	0		
J&K	N	3	2	1	50		1
	S	6	4	0	0		
	T	9	6	1	17		1
Kar	N	3	3	2	67	2	*1
	S	14	13	1	8		1
	T	17	16	3	19	2	2
Ker	N	3	2	0	0		
	S	11	11	1	9	1	
	T	14	13	1	8	1	

\* 1 sanctuary reported both an addition as well as a deletion of area.

Table I:2 (contd)

1	2	3	4	5	6	7
State/ U.T.	Total N/S	N/S responding	N/S with alteration	4 as % of 3	N/S with addition	N/S with deletion
Mah	N	4	3	0	0	
	S	22	11	0	0	
	T	26	14	0	0	
Man	N & T	2	1	1	100	1
Meg	S & T	2	2	0	0	
MP	N	11	6	1	17	1
	S	31	30	7	23	5
	T	42	36	8	22	6
Nag	S & T	3	1	0	0	
Ori	N	1	0			
	S	15	3	0	0	
	T	16	3	0	0	
Raj	N	4	3	0	0	
	S	18	15	2	13	1
	T	22	18	2	11	1
Sik	N	1	1	0	0	
	S	3	1	0	0	
	T	4	2	0	0	
TN	N	1	1	0	0	
	S	10	5	1	20	1
	T	11	6	1	17	
UP	N	4	4	1	25	1
	S	13	11	0	0	
	T	17	15	1	7	1
WB	N	1	1	0	0	
	S	13	8	1	13	1
	T	14	9	1	11	1
All India	N	51	35	9	26	5
	S	243	179	16	9	10
	T	294	214	25	12	16

Table II:1.1a Highest Point \* (Extended Database)

N/S	Highest point (m)	N/S	Highest point (m)
SIK/N/KHA	8585	MP/S/BOR	1151
UP/N/NAN	7817	ORI/S/SIM	1150
J&K/N/KIS	7100	ORI/N/SIM	1150
UP/N/VAL	6500	BIH/S/PAL	1140
UP/S/COV	6315	MAH/S/BHI	1140
HP/N/GRE	6140	KAR/S/NUG	1130
HP/S/SEC	6000	KAR/S/MEL	1130
HP/S/KUG	5975	KER/S/CHIM	1116
HP/S/TUN	5516	KER/S/PEP	1100
HP/S/RAK	5466	KAR/S/SHE	1100
HP/S/RUP	5349	MIZ/S/DAM	1090
HP/S/TIR	5227	GUJ/S/JES	1089
HP/S/KAN	4833	KAR/S/SOM	1066
ARU/N/NAM	4500	KAR/N/BANN	1050
J&K/N/DAC	4289	MAH/S/RAD	1009
HP/S/LIP	4250	ARU/S/PAK	1000
J&K/S/OVE	4085	BIH/S/HAZ	1000
HP/S/NAR	4025	MAH/S/MEL	995
HP/S/MAH	4000	MAH/S/DHA	992
HP/S/GAM	3750	KER/S/FEE	992
ARU/S/MEH	3560	MP/N/SAN	980
HP/S/KAI	3481	RAJ/S/TOD	968
UP/N/COR	3423	KAR/S/ADI	960
HP/S/SHK	3359	MEG/S/NON	950
HP/S/TAL	3358	BIH/S/DAL	934
KER/N/SIL	3015	KAR/N/NAG	933
HP/S/KHO	3000	ORI/S/SAT	927
KER/N/ERA	2695	AP/S/NAG	917
HP/S/KAL	2668	MP/S/TAM	900
SIK/S/FAM	2650	KER/S/WYN	890
TN/S/NIL	2600	MP/N/KAN	877
MAN/N/SIR	2553	GUJ/S/DUM	874
TN/S/ANA	2548	KAR/S/BLA	860
HP/S/CHA	2408	ORI/S/BAI	855
AP/S/SIW	2180	AP/S/PAP	825
AP/S/KAW	2180	MAH/S/TAN	818
AP/S/PRA	2180	MAH/S/NAN	815
HP/S/BAN	2118	MP/N/BAN	807
KER/N/PER	2019	KER/S/ARA	800
KAR/S/GHA	2012	MP/N/KANG	791
HP/S/MAJ	1985	MAN/N/KEI	788
TN/S/MUN	1867	J&K/S/NAN	786
KER/S/NEY	1858	RAJ/N/SAR	777
HP/S/DARL	1846	RAJ/S/SAR	777
HP/S/SHIL	1845	MP/N/FOS	760
TN/S/KAL	1775	HP/S/GOB	750
RAJ/S/MOU	1722	MP/S/PHE	750
MAH/S/KAL	1654	MP/S/KHA	750
MP/S/GAN	1651	HP/S/SIM	735
KER/S/SHE	1554	A&N/N/SAD	732
KAR/S/BIL	1515	GOA/S/COT	725
KAR/N/BAN	1450	KAR/S/RAN	722
KER/S/PER	1443	MP/S/PEN	720
TN/S/MUD	1400	A&N/S/TIL	701
KAR/S/BRA	1363	GUJ/S/RAT	700
MP/N/SAT	1352	RAJ/S/JAI	696
UP/S/CHI	1345	NAG/S/INT	693
MP/S/PAC	1308	AP/S/POC	671
RAJ/S/KUM	1300	MP/S/NAU	656
MP/S/SEM	1240	MP/S/SING	654
MP/S/BAD	1200	MP/S/SIT	650
KAR/S/MOO	1200	KER/S/THA	650
HP/S/NAI	1198	RAJ/S/VAN	650
ARU/S/TTA	1164		

\* In descending order of height; height in 'metres above mean sea level' (m)

Table II:1.1a (contd)

N/S	Highest point (m)	N/S	Highest point (m)
MP/S/RAT	633	RAJ/S/SHE	425
GUJ/S/BAR	627	RAJ/S/KAI	423
GUJ/S/BAR	627	MP/S/BAR	400
J&K/S/RAM	611	UP/S/RAN	381
CHA/S/SUK	610	GOA/S/BON	375
KAR/S/DAN	608	MP/S/KAR	368
MP/N/IND	607	MAH/N/TAD	355
HP/S/REN	580	GUJ/N/BAN	330
RAJ/S/SIT	577	MAH/S/PHA	320
MP/S/NAR	576	GUJ/S/HIN	300
MAH/N/PEN	574	UP/S/MAH	300
BIH/S/TOP	572	MP/S/SON	300
MP/S/ACH	570	AP/S/ETU	291
MAH/S/GRE	568	UP/S/KAI	275
MP/N/VAN	565	BIH/S/VAL	243
AP/S/KIN	560	MP/S/NAT	220
AP/S/PAK	560	HAR/S/SUL	219
MP/S/SAI	560	ORI/S/CHA	202
ORI/S/HAD	556	UP/N/DUD	182
MAH/S/BOR	548	RAJ/N/KEO	175
BIH/S/GAU	545	UP/S/KIS	175
MP/S/SAN	541	ARU/S/LAL	150 #
MP/N/PAN	538	WB/S/JAL	140
AP/S/MAN	532	GUJ/S/NAR	140
GUJ/N/GIR	531	GUJ/S/DHR	125
MP/S/KHE	525	A&N/N/MAR	100
MP/S/UDA	521	A&N/S/INT	84
MP/S/GOM	508	TN/N/GUI	60
RAJ/S/JAW	508	GUJ/N/VEL	50
MAH/S/NAG	504	A&N/N/NOR	46
RAJ/S/RAM	502	ORI/S/NAN	45
KAR/S/SHA	500	A&N/N/SOU	45
RAJ/N/RAN	500	A&N/S/SOU	40
MP/S/BAG	500	A&N/S/NAR	40
BIH/S/BHI	496	A&N/S/NOR	30
BIH/S/LAW	495	A&N/N/MID	25
MAH/N/SAN	486	GUJ/S/NAL	24
MP/S/PAL	485	WB/S/RAM	20
MAH/N/NAW	481	A&N/S/CRO	15
MAH/S/KIN	481	A&N/S/MEG	10
MP/N/MAD	480	A&N/S/BAT	10
MAH/S/KAR	479	WB/S/SAJ	9
RAJ/S/NAT	461	WB/N/SUN	9
MP/S/PAN	460	AP/S/NEE	8
MAH/S/YAW	456	ORI/S/BHI	5
RAJ/S/DAR	455	AP/S/PUL	5
MP/S/GHA	443	TN/S/POI	3
HP/S/PON	436		
A&N/N/MOU	430		
UP/S/MOT	427		

# This appears to be a mistake in reporting.

Table II:1.1b Lowest Point\* (Extended Database)

N/S	Lowest point (m)	N/S	Lowest point (m)
A&N/S/SOU	0	UP/S/RAN	137
A&N/S/TIL	0	UP/S/KAI	140
A&N/S/NOR	0	UP/S/KIS	145
A&N/N/MID	0	UP/N/DUD	150
A&N/S/NAR	0	ARU/S/LAL	150
A&N/S/MEG	0	KAR/S/DAN	150
A&N/S/INT	0	GUJ/N/GIR	152
A&N/S/CRO	0	BIH/S/DAL	154
A&N/S/BAT	0	RAJ/S/RAM	158
A&N/N/NOR	0	RAJ/N/KEO	172
A&N/N/SOU	0	GUJ/N/BAN	173
ORI/S/BHI	0	MP/S/SON	180
A&N/N/SAD	0	BIH/S/GAU	183
AP/S/KOL	0	KER/S/PEE	186
KAR/S/MOO	0	HP/S/REN	200
WB/N/SUN	0	RAJ/S/KAI	200
TN/S/POI	0	RAJ/S/SIT	200
GUJ/N/MAR	0	MP/N/PAN	200
A&N/N/MAR	0	ARU/N/NAM	200
TN/S/VED	0	GUJ/S/HIN	200
KAR/S/SOM	0	ARU/S/PAK	200
WB/S/SAJ	2	ARU/S/ITA	210
AP/S/PUL	2	MP/N/IND	211
GUJ/S/NAR	3	RAJ/N/RAN	215
AP/S/NEE	3	MP/S/KAR	215
GUJ/N/VEL	10	HAR/S/SUL	216
GOA/S/COT	12	MP/S/GOM	222
GUJ/S/DHR	18	MP/S/GHA	223
KER/S/CHM	20	MP/S/PAL	239
WB/S/RAM	20	AP/S/PAK	240
AP/S/PAP	20	MP/S/KHA	250
GUJ/S/NAL	24	GUJ/S/JES	259
KER/S/SHE	25	MP/S/BAR	265
KER/S/PEP	30	GUJ/S/DLM	270
A&N/N/MOU	30	RAJ/S/SHE	275
MAH/N/SAN	30	MAH/N/NAW	275
ORI/S/NAN	30	BIH/S/TOP	280
KER/S/THA	30	MP/S/NAU	280
ORI/S/CHA	40	MAH/S/BOR	283
ORI/S/BAI	47	MAH/N/TAD	286
GUJ/S/BAR	50	MAH/S/KIN	289
ORI/N/SIM	50	KAR/S/SHA	300
GOA/S/BON	50	BIH/S/HAZ	300
MAH/S/PHA	50	BIH/S/PAL	300
ORI/S/HAD	50	TN/S/ANA	300
ORI/S/SIM	50	UP/S/CHI	300
TN/N/GUI	50	UP/S/MAH	300
MAH/S/KAR	53	MP/S/UDA	306
WB/S/JAL	60	MP/S/SAN	330
ORI/S/SAT	63	MAH/S/KAL	333
GOA/S/BHA	75	HP/S/SIM	335
GOA/N/BHA	75	HP/S/TON	335
MIZ/S/DAM	76	MP/S/SING	336
KER/S/NEY	90	MP/N/KANG	338
AP/S/ETU	92	MP/S/PAC	340
KER/S/ARA	100	MP/S/PEN	344
TN/S/MUN	100	MP/S/BOR	350
MAH/S/DHA	100	MP/S/SIT	350
MAH/S/MEL	100	J&K/S/RAM	350
AP/S/KIN	108	MP/N/MAD	360
MP/S/NAT	120		
BIH/S/VAL	125		

\*In ascending order of height; height in 'metres above mean sea level' (m)

Table II:1.1b (contd)

N/S	Lowest point (m)	N/S	Lowest point (m)
MP/N/SAT	360	MP/N/FOS	720
J&K/S/NAN	370	MAN/N/KEI	758
MAH/S/NAG	372	KAR/N/NAG	760
MP/S/PAN	373	HP/S/BAN	762
MAH/N/PEN	377	MAH/S/NAN	762
CHA/S/SUK	380	KAR/N/BAN	780
MP/N/SAN	380	KAR/S/BRA	820
RAJ/S/DAR	390	KAR/S/ADI	820
BH/S/LAW	390	KAR/N/BANN	850
MP/S/KHE	390	KAR/S/NUG	892
AP/S/NAG	400	KAR/S/MEL	892
RAJ/N/SAR	400	KER/N/PER	900
RAJ/S/SAR	400	HP/S/MAJ	900
MEG/S/NON	400	HP/S/RUP	914
ARU/S/MEH	404	HP/S/NAR	970
MP/S/TAM	405	KER/N/SIL	1000
MAH/S/YAW	426	UP/N/COR	1000
BH/S/BHI	450	HP/S/DARL	1075
MP/N/BAN	450	MP/S/GAN	1140
RAJ/S/VAN	450	KAR/S/BIL	1169
AP/S/POC	460	HP/S/KAL	1185
RAJ/S/KUM	460	HP/S/SHIL	1230
MP/S/NAR	462	UP/S/GOV	1300
MP/S/BAC	476	KER/N/ERA	1400
MAH/S/GRE	483	HP/S/TAL	1500
MP/N/VAN	500	HP/S/KHO	1500
MP/S/BAD	500	HP/N/GRE	1500
AP/S/PRA	500	SIK/S/FAM	1600
AP/S/KAW	500	J&K/N/DAC	1629
KER/S/VER	500	J&K/N/KIS	1700
GUJ/S/RAT	500	TN/S/NIL	1700
KAR/S/SHI	500	HP/S/SHIK	1800
AP/S/STW	500	HP/S/KAN	1800
MP/S/ACH	505	HP/S/GAM	1800
MP/N/KAN	506	HP/S/TUN	1800
MP/S/RAT	510	SIK/N/KHA	1829
KAR/S/ELA	510	MAN/N/SIR	1938
HP/S/TAI	548	J&K/S/OVE	2000
MP/S/PHE	566	UP/N/NAN	2000
RAJ/S/JAI	570	HP/S/MAH	2000
MP/S/SEM	572	HP/S/TIR	2100
TN/S/KAL	580	HP/S/KUG	2250
RAJ/S/TOD	600	HP/S/SEC	2550
MAH/S/RAD	600	HP/S/KAI	2800
KER/S/WYN	611	HP/S/RAK	3200
MAH/S/BHI	640	UP/N/VAL	3200
TN/S/MUD	650	HP/N/PIN	3300
KAR/S/RAN	690	HP/S/LIP	4000
HP/S/GOB	699		
HP/S/CHA	700		
	701		

Table II:1.2a Average Annual Rainfall\* (Extended Database)

N/S	Average rainfall # (mm)	N/S	Average rainfall # (mm.)
HP/S/LIP	23	MP/N/MAD	896
HP/S/RUP	45	MP/S/KHE	900
HP/S/RAK	50	AP/S/TOC	900
HP/S/DAR	55	UP/S/KAI	920
J&K/S/LUN	76	MAH/S/KIN	925
J&K/N/HEM	76	RAJ/S/BHE	946
HP/S/TAL	100	MP/N/SAN	950
HP/S/DARL	104	MP/S/SON	962
HP/S/MAJ	104	MP/S/PAL	965
J&K/N/KIS	120	GUJ/S/RAT	986
HP/S/KAN	124	MP/S/BAG	987
RAJ/N/DES	150	TN/S/VED	1000
GUJ/S/NAR	300	MAH/S/BOR	1000
MP/N/FOS	300	AP/S/KOL	1000
UP/N/COR	302	UP/S/NAW	1000
TN/S/MUD	350	AP/S/PAK	1000
RAJ/S/TAL	390	GUJ/N/GIR	1000
HP/S/NAI	445	KAR/S/NUC	1016
HP/S/KUG	445	BIH/S/BIH	1020
GUJ/S/JES	450	AP/S/KIN	1033
TN/S/NIL	450	HP/S/KAI	1071
HAR/S/SUL	500	MP/S/TAM	1080
GUJ/S/NAL	500	HP/S/MAN	1080
GUJ/S/HIN	500	GUJ/S/DUM	1081
HP/S/SEC	500	AP/S/ETU	1100
KAR/S/RAN	515	CHA/S/SUK	1116
RAJ/S/TOD	570	MP/S/KEN	1125
RAJ/S/JAI	570	MP/S/ACH	1125
UP/S/MAH	578	MP/S/SING	1130
GUJ/S/DHR	600	AP/S/SIW	1146
GUJ/N/VEL	600	AP/S/PRA	1146
RAJ/S/PHU	600	AP/S/KAW	1146
MAH/S/YAW	600	BIH/S/RAJ	1150
KAR/S/MEL	603	WB/S/RAH	1150
KAR/S/BLA	619	BIH/S/GAU	1156
RAJ/S/NAT	625	MP/S/SAN	1168
RAJ/S/JAW	625	MP/S/RAT	1170
RAJ/N/SAR	650	MP/N/BAN	1170
RAJ/S/SAR	650	MP/N/VAN	1172
RAJ/N/KEO	650	MP/S/PAN	1173
MP/S/KAR	688	MP/S/SEM	1185
KAR/S/ADI	690	HP/S/KHO	1200
KAR/N/BANN	700	BIH/S/PAL	1200
RAJ/S/VAN	710	MAN/N/SIR	1224
RAJ/S/SIT	750	MP/N/PAN	1225
MAH/S/GRE	754	J&K/S/OVE	1243
RAJ/S/KUM	760	UP/S/CHA	1250
KAR/S/GHA	785	UP/S/CHI	1250
AP/S/COR	800	MP/S/NAU	1251
RAJ/N/RAN	800	HP/S/SIM	1260
RAJ/S/DAR	800	BIH/S/TOF	1260
MP/S/KHA	800	BIH/S/DAL	1275
HP/S/TUN	800	MAN/N/KEI	1281
MAH/S/NAN	815	ORI/S/BAI	1300
GUJ/S/BAR	815	TN/N/GUI	1300
MP/S/GAN	850	TN/S/PUL	1300
RAJ/S/RAH	850	MP/S/SIT	1320
GUJ/S/KHI	854	BIH/S/LAW	1320
MP/S/SAI	860	MP/S/GOM	1350
RAJ/S/SHE	870		
MP/S/GHA	893		

\* In ascending order of precipitation; rainfall in 'millimetres'

# Does not include snow precipitation

Table II:1.2a (contd)

N/S	Average rainfall # (mm)	N/S	Average rainfall # (mm)
MP/N/PEN	1398	MP/N/SAT	2265
MP/S/PEN	1398	MIZ/S/DAM	2300
WB/S/BAL	1400	MAH/S/PHA	2400
MP/S/BAR	1400	KAR/S/BHA	2500
BIH/S/VAL	1422	ARU/S/PAK	2500
MP/N/KAN	1500	KER/N/PER	2500
UP/S/KIS	1500	KER/N/SIL	2500
MAH/S/NAG	1500	MAH/N/SAN	2600
ORI/S/NAN	1500	KAR/S/SHE	2600
AP/S/NAG	1500	KER/S/PEE	2800
ORI/S/HAD	1500	KER/S/NEY	2800
ORI/S/CHA	1500	MAH/S/KAL	3000
MAH/N/TAD	1500	MAH/S/TAN	3000
HP/S/TIR	1500	MAH/S/BHI	3000
UP/N/DUD	1500	KER/S/CHIM	3000
ORI/S/SAT	1500	KER/S/THA	3048
UP/S/GOV	1500	A&N/N/SAD	3100
MP/S/PHE	1500	A&N/S/NOR	3100
A&N/N/MOU	1541	A&N/S/NAR	3100
MP/S/NAR	1550	MAH/S/KAR	3147
AP/S/PAP	1568	A&N/N/MID	3180
MEG/S/NON	1570	A&N/S/BAT	3180
MP/S/UDA	1585	A&N/S/CRO	3180
MP/N/KANG	1600	A&N/N/SOU	3180
GUJ/N/BAN	1600	A&N/N/NOR	3180
HP/S/CHA	1603	SIK/N/KHA	3180
MAH/S/MEL	1625	A&N/S/INT	3180
KAR/N/NAG	1650	A&N/N/MAR	3180
ORI/S/BHI	1700	A&N/S/MEG	3180
BIH/S/HAZ	1700	A&N/S/SOU	3180
KER/S/PER	1750	A&N/S/TIL	3180
MP/N/IND	1778	SIK/S/FAM	3493
KAR/S/DAN	1778	KER/S/PEP	3500
MP/S/BHA	1778	KER/S/IDU	3563
HP/S/PON	1780	KAR/S/MOO	4000
MEG/S/SIJ	1828	ARU/S/MEH	4189
MAH/N/NAW	1906	WB/S/JAL	4200
WB/S/SAJ	1920	MAH/S/RAD	4347
WB/N/SUN	1920	KER/S/ARA	4650
NAG/S/INT	2000	KAR/S/SHA	5000
ORI/S/SIM	2000	KAR/S/SOM	5000
TN/S/ANA	2000	GOA/N/BHA	5500
ORI/N/SIM	2000	GOA/S/BHA	5500
HP/S/KAL	2000	GOA/S/COT	5500
RAJ/S/MOU	2009	GOA/S/BON	5500
MP/S/BOR	2073		
HP/S/REN	2108		
MP/S/PAC	2265		

Table II:1.2b Maximum Temperature\* (Extended Database)

N/S	Maximum temperature (in degrees celsius)	N/S	Maximum temperature (in degrees celsius)
RAJ/N/DES	50	AP/S/SIW	45
KER/S/IDU	50 #	RAJ/S/DAR	45
MP/S/BAG	49	GUJ/S/RAT	44
UP/S/RAN	49	WB/S/RAM	44
AP/S/KIN	49	AP/S/NEE	44
RAJ/N/KEO	49	RAJ/S/KUM	44
UP/S/KAI	49	GUJ/S/NAL	44
MAH/S/DHA	48	AP/S/KAW	44
RAJ/S/JAM	48	MP/S/ACH	44
MAH/S/MEL	48	MAH/S/NAG	44
WB/S/BAL	48	RAJ/S/JAW	44
MP/S/NAT	48	MP/N/FOS	44
MAH/N/PEN	48	GUJ/N/BAN	44
RAJ/S/KAI	48	RAJ/S/SIT	44
BIH/S/PAL	48	AP/S/PRA	44
GUJ/S/NAR	48	HP/S/PON	44
UP/N/COR	48	RAJ/N/SAR	43
MP/S/BHA	48	UP/S/CHI	43
MP/N/IND	48	RAJ/S/SAR	43
MAH/S/KIN	47	MP/N/PEN	43
UP/S/NAW	47	GUJ/S/DHR	43
MAH/N/NAW	47	UP/S/NAT	43
HP/S/GOB	47	MP/N/PAN	43
MAH/N/TAD	47	BIH/S/TOF	43
RAJ/S/SHE	47	GUJ/S/JES	43
J&K/S/RAM	47	MP/S/PEN	43
MP/S/GOM	47	ORI/S/BHI	43
J&K/S/NAN	47	ORI/S/BAI	43
BIH/S/BHI	47	GUJ/S/BAR	42
MP/S/NAU	46	ORI/S/CHA	42
AP/S/ETU	46	GUJ/N/VEL	42
MP/S/SON	46	MP/S/UDA	42
MP/S/TAM	46	GUJ/N/GIR	42
AP/S/PAK	46	BIH/S/RAJ	42
MP/S/SEM	46	RAJ/S/VAN	42
CHA/S/SUK	46	TN/N/GUI	42
HAR/S/SUL	46	MP/S/SIT	42
RAJ/N/RAN	46	MP/S/SAN	42
MAH/S/BOR	46	AP/S/NAG	42
MP/S/PAL	46	AP/S/PUL	42
RAJ/S/NAT	46	AP/S/POC	42
HP/S/SIM	46	AP/S/PAP	42
MP/S/KAR	46	GUJ/S/HIN	42
RAJ/S/BHE	46	MP/S/SING	42
ORI/S/SIM	45	TN/S/VED	42
BIH/S/GAU	45	UP/S/GOV	42
RAJ/S/TOD	45	MP/S/SAI	42
ORI/N/SIM	45	UP/S/MAH	42
RAJ/S/TAL	45	MP/S/PHE	42
MP/S/KEN	45	TN/S/PUL	42
HP/S/REN	45	ORI/S/NAN	42
UP/S/KIS	45	MP/S/KHE	42
MAH/S/YAW	45	MP/N/BAN	42
ORI/S/SAT	45	MAH/S/TAN	42
UP/S/KAT	45	MP/S/GAN	42
UP/N/DUD	45	MP/N/KAN	42
RAJ/S/JAI	45	MP/S/PAN	42
MP/N/SAN	45	KER/N/SIL	42
BIH/S/LAW	45		
MP/N/MAD	45		

\* In descending order of temperatures

# This could be a mistake in reporting

Table II:1.2b (contd)

N/S	Maximum temperature (in degrees celsius)	N/S	Maximum temperature (in degrees celsius)
MAH/S/KAL	41	KAR/N/NAG	32
GUJ/S/DUM	41	AP/S/KOL	32
MP/N/VAN	41	A&N/N/MOU	32
MAN/N/KEI	41	KAR/S/GHA	32
BIH/S/VAL	40	KAR/S/ADI	32
BIH/S/HAZ	40	MP/S/GHA	32
AP/S/MAN	40	KAR/S/BRA	32
GOA/S/COT	40	J&K/N/DAC	32
MP/N/KANG	40	MP/S/RAT	32
KER/S/PEE	40	A&N/S/MEG	31
HP/S/NAI	40	A&N/N/MID	31
J&K/S/SUR	40	A&N/N/NOR	31
MAH/S/NAN	39	A&N/N/SAD	31
KAR/S/BIL	39	MEG/S/SIJ	31
MAH/S/GRE	39	A&N/S/BAT	31
KAR/S/MEL	38	A&N/N/SOU	31
KAR/S/BLA	38	A&N/N/MAR	31
KER/S/ARA	38	A&N/S/NOR	31
KAR/S/NUG	38	A&N/S/SOU	31
MP/S/KHA	38	A&N/S/TIL	31
RAJ/S/MOU	38	A&N/S/INT	31
RAJ/S/PHU	38	A&N/S/NAR	31
GOA/S/BON	38	KAR/N/BAN	30
MAH/S/RAD	38	HP/S/TUN	30
ORI/S/HAD	38	HP/S/TIR	30
KAR/S/DAN	37	MAH/S/KAR	30
GOA/N/BHA	37	MP/S/BOR	30
GOA/S/BHA	37	TN/S/ANA	30
KAR/S/SOM	37	HP/S/DARL	30
WB/S/JAL	37	HP/S/KHO	30
MAH/S/PHA	36	HP/S/SHIL	30
MP/S/PAC	36	A&N/S/CRO	30
MAH/S/BHI	36	HP/S/SHIK	30
KAR/S/SHE	36	HP/S/MAN	30
KER/S/CHIM	36	HP/S/MAJ	29
ARU/S/ITA	36	KER/N/ERA	29
MF/N/SAT	36	HP/S/TAL	28
KER/S/THA	35	NAG/S/INT	28
KAR/S/BHA	35	HP/S/CHA	28
KER/S/PEP	35	HP/N/PIN	27
J&K/N/KIS	35	HP/S/SEC	27
KAR/N/BANN	35	ARU/S/PAK	26
HP/S/GAM	35	HP/S/KUG	25
KER/N/PER	35	TN/S/KAL	25#
HP/S/KAL	35	J&K/N/HEM	25
ARU/N/NAM	35	J&K/S/OVE	25
KER/S/NEY	35	J&K/S/LUN	25
KAR/S/RAN	35	MEG/S/NON	23
KER/S/SHE	35	TN/S/MUD	22#
KAR/S/MOO	35	TN/S/NIL	20#
AP/S/COR	35	SIK/S/FAM	19
KER/S/PER	35	SIK/N/KHA	18
KER/S/WYN	35	HP/S/DAR	17
MAN/N/SIR	34	HP/S/RAK	15
TN/S/POI	33	HP/S/RUP	15
KAR/S/SHA	33	HP/S/LIP	15
WB/S/SAJ	33		
WB/N/SUN	33		
MIZ/S/DAM	32		

# This could be a mistake in reporting

Table II:1.2c Minimum Temperature\* (Extended Database)

N/S	Minimum temperature (in degrees celsius)	N/S	Minimum temperature (in degrees celsius)
J&K/S/LUN	-40	RAJ/S/SIT	2
J&K/N/HEM	-40	MP/S/KAR	3
HP/N/PIN	-20	UP/S/NAW	3
HP/S/KAL	-10	MAN/N/SIR	3
HP/S/LIP	-10	UP/S/RAN	3
HP/S/RAK	-10	MP/S/NAT	3
HP/S/RUP	-10	BIH/S/PAL	3
HP/S/SHK	-10	MP/S/PAN	4
HP/S/TUN	-10	MP/S/PAL	4
HP/S/GAM	-10	MAH/N/PEN	4
HP/S/KUG	-10	MP/N/PAN	4
HP/S/DAR	-8	MP/S/SIT	4
J&K/N/DAC	-8	MP/N/PEN	4
J&K/N/KIS	-7	BIH/S/RAJ	4
HP/S/TAL	-7	MP/N/BAN	4
ORI/S/SEM	-5	MP/S/PEN	4
ORI/N/SIM	-5	BIH/S/LAW	1
RAJ/N/DES	-5	J&K/S/KAM	5
HP/S/KHO	-5	UP/S/NAT	5
HP/S/TIR	-5	TN/S/MUD	5
HP/S/CHA	-4	GUJ/S/NAL	5
HP/S/SHIL	-4	GUJ/S/DUM	5
HP/S/MAN	-4	GUJ/S/DHR	5
SK/N/KHA	-4	ORI/S/SAT	5
HP/S/NAI	-2	MP/S/SON	5
RAJ/S/DAR	-2	MP/S/RAT	6
RAJ/S/KUM	-2	BIH/S/HAZ	6
HP/S/SIM	-1	HP/S/PON	6
MP/S/GOM	-1	WB/S/BAL	6
HP/S/GOB	-1	GUJ/S/RAT	6
HP/S/DARL	-1	BIH/S/VAL	6
HP/S/MAJ	-1	RAJ/S/MOU	6
RAJ/S/VAN	0	MP/S/BAG	6
MAN/N/KEI	0	MP/S/SING	6
RAJ/S/TOD	0	MEG/S/NON	6
CHA/S/SUK	0	GUJ/S/NAR	6
MP/N/MAD	0	UP/S/MAH	6
TN/S/NIL	0	WB/S/RAM	6
RAJ/S/JAI	0	GUJ/S/HEN	7
RAJ/N/SAR	0	MAH/S/BHI	7
RAJ/S/SAR	0	AP/S/KAW	7
HP/S/REN	1	UP/S/KAT	7
RAJ/S/KAI	1	MP/N/SAN	7
MP/S/PAC	1	RAJ/S/PHU	7
RAJ/S/TAL	1	SIK/S/FAM	7
MP/S/TAM	2	AP/S/POC	7
UP/N/COR	2	MAH/S/KIN	7
MP/N/KAN	2	MP/S/UDA	8
MP/S/PHE	2	KAR/S/SHA	8
MP/S/BHA	2	MP/N/FOS	8
UP/S/KAI	2	RAJ/S/NAT	8
MP/S/BAR	2	MAH/S/MEL	8
MP/S/NAU	2	KAR/S/SOM	8
MP/N/IND	2	GUJ/N/GIR	8
MP/S/SEM	2	MP/S/SAN	8
RAJ/N/KEO	2	MAH/S/DHA	8
UP/S/GOV	2	ORI/S/CHA	8
MP/N/SAT	2	MP/S/ACH	8
RAJ/S/SHE	2		
RAJ/N/RAN	2		

\* In ascending order of temperatures

Table II:1.2c (contd)

N/S	Minimum temperature (in degrees celsius)	N/S	Minimum temperature (in degrees celsius)
BIH/S/BIH	8	GOA/S/BHA	15
RAJ/S/JAW	8	KAR/S/SHE	15
MEG/S/SIJ	9	WB/N/SUN	15
AP/S/SIW	9	A&N/S/NAR	15
UP/N/DUD	9	GOA/S/COT	15
GUJ/S/JES	9	MAH/S/GRE	15
AP/S/PRA	9	MAH/S/KAR	15
AP/S/KIN	10	MAH/S/RAD	15
ARU/N/NAM	10	MP/S/GHA	15
NAG/S/INT	10	AP/S/COR	15
ARU/S/ITA	10	KER/S/IDU	15
KAR/S/MOO	10	GOA/N/BHA	15
ORI/S/NAN	10	HAR/S/SUL	15
MP/N/KANG	10	TN/S/ANA	15
ORI/S/BIH	10	WB/S/SAJ	15
MP/S/SAI	10	GOA/S/BON	15
MIZ/S/DAM	10	WB/S/JAL	16
UP/S/KIS	10	KAR/S/RAN	16
KAR/S/BHA	10	KER/S/NEY	16
BIH/S/GAU	10	MAH/S/TAN	16
KER/N/ERA	10	KER/S/PEP	16
MP/S/BOR	10	MAH/N/NAW	17
GUJ/S/BAR	10	KER/S/CHIM	17
MP/N/VAN	11	KER/S/THA	18
MAH/S/YAW	11	KAR/S/GHA	18
AP/S/PAP	11	KER/N/SIL	19
MAH/S/NAG	11	MP/S/BAD	19
MP/S/KHA	11	A&N/S/NOR	19
AP/S/MAN	12	A&N/N/SAD	19
TN/S/KAL	12	TN/S/PUL	20
ORI/S/HAD	12	TN/N/GUI	20
AP/S/NAG	12	TN/S/VED	20
MAH/S/NAN	12	BIH/S/TOP	20
ORI/S/BAI	12	GUJ/N/BAN	20
AP/S/ETU	12	UP/S/CHI	20
KER/S/PER	12	A&N/N/MOU	21
MAH/N/TAD	12	TN/S/POI	21
AP/S/NEL	12	A&N/S/INT	22
MAH/S/PHA	12	A&N/N/MID	22
GUJ/N/VEL	12	A&N/N/NOR	22
AP/S/PUL	12	A&N/S/BAT	22
MAH/S/KAL	12	A&N/N/SOU	22
KAR/N/NAG	12	A&N/S/CRO	22
MAH/S/BOR	13	A&N/S/TIL	22
RAJ/S/BHE	13	A&N/N/MAR	22
KAR/S/BLA	13	A&N/S/MEG	22
KER/S/PEE	13	A&N/S/SOU	22
KER/S/WYN	13	KER/S/ARA	22
MP/S/GAN	14	KER/S/SHE	23
KAR/S/DAN	14	KAR/N/BANN	25 #
AP/S/PAK	14		
MP/S/KEN	15		

# This appears to be a mistake in reporting

Table II:1.3 Forest Types (Extended Database)\*

N/S	Forest types**
A&N/N/MAR	1A/C2; 4A/L1, 4B/TS2; WETLAND
A&N/N/MOU	1A/C1, 1A/C2; 4A/L1, 4B/TS2
A&N/N/NOR	4A/L1, 4B/TS2
A&N/N/SAD	1A/C2; 2A/C1; 3A/C1
A&N/N/SOU	4A/L1, 4B/TS2
A&N/S/BAR	1A/C1, 1A/C2
A&N/S/BAT	2A/C1; 4A/L1, 4B/TS2
A&N/S/CRO	1A/C2; 2A/C1; 4A/L1, 4B/TS2
A&N/S/INT	1A/C2; 2A/C1; 4A/L1, 4B/TS2
A&N/S/MEG	2A/C1; 4A/L1, 4B/TS2
A&N/S/NAR	1A/C1, 1A/C2, 1A/E1; 2A/C1; 3A/C1
A&N/S/NOR	1A/C1, 1A/C2, 1A/E1; 2A/C1; 3A/C1; 4A/L1
A&N/S/SOU	1A/C2; 4A/L1, 4B/TS2
A&N/S/TIL	2A/C1; 4A/L1, 4B/TS2
AP/S/COR	4A/L1
AP/S/ETU	5A/C1, 5A/C1(B), 5A/C3
AP/S/KAW	5A
AP/S/KIN	5A/C3, 5/E9
AP/S/KOL	WETLAND
AP/S/MAN	WETLAND
AP/S/NAG	5A
AP/S/NEE	WETLAND
AP/S/PAK	5A/C1, 5A/C1(B), 5A/C3
AP/S/PAP	5A/C3
AP/S/POC	5A
AP/S/PRA	5A
AP/S/PUL	WETLAND
AP/S/SIW	5A
ARU/N/NAM	1B/C1, 1A/C2(A), 1A/C2(B); 2B/C1, 2B/2S1; 3/1S2(B); 13/C6
ARU/S/ITA	2B/C1
ARU/S/LAL	2B/C1
ARU/S/MEH	1; 2B/C1/1S1, 2B/C1/2S1, 2B/C1/2S2; 8B; 9
ARU/S/PAK	1B/C2(B); 2B/C1, 2B/C1/1S1; 3/1S2(B); 4E/RS1
ASS/N/KAZ	1/E1; 2B/C1/2S2; 3/1S1, 3C/C3/2S1; 4B/TS2
ASS/S/BAR	2B/C1(B); 3C/C2/DS1, 3C/C3(B), 3/1S2
ASS/S/GAR	2B/C1(A), 2B/C1(B)
ASS/S/LAO	3/1S1; 4D/2S2
ASS/S/MAN	2B/C1(B), 2B/1S1, 2B/2S2, 2B/2S3; 3C/C2/DS1, 3C/C3(B), 3C/1S1; 4D/2S2; 5/1S2
ASS/S/ORA	4D/2S2
BIH/S/BHI	3C/C2(E)(II); 5B/C1(C)(II), 5B/C2
BIH/S/DAL	5B/C1(C), 5B/C2
BIH/S/GAU	5B/C1(C), 5B/C2, 5B/DS1, 5B/DS2, 5/E2, 5/E5, 5/E9

\* Data pertaining to Assam, Chandigarh, and Mizoram has been obtained from a brief questionnaire sent to these areas prior to sending the detailed Questionnaire I.

\*\* In many cases the exact sub-group, type or sub-type is not specified or is unclear, e.g. Kawal Sanctuary (AP/S/KAW) reported the sub-group 5A (Southern tropical dry deciduous forests), but did not specify which type (5A/C1, 5A/C2, or 5A/C3) was found there.

Table II:1.3 (contd)

N/S	Forest types**
BIH/S/HAZ	5B/C1(C), 5B/C2, 5/E9
BIH/S/KAI	5B/C1(C)
BIH/S/LAW	5B
BIH/S/MAH	5B
BIH/S/NAG	WETLAND
BIH/S/PAL	3C/C2(E)(I), 3C/C2(E)(II), 3C/C3(A), 3C/2S1; 5B/C1(C), 5B/C2, 5/E6, 5/E9
BIH/S/RAJ	3C; 5B, 5B/C2
BIH/S/TOP	5B
BIH/S/UDA	WETLAND
BIH/S/VAL	1/E1; 3C/C2(B)(I), 3C/C3(A); 4D/SS2, 4D/2S2; 5B/C1(A), 5B/1S2
CHA/S/SUK	5B/DS1; WETLAND
GOA/N/BHA	1A/C4, 1/E1; 2A/C2; 3B/C1(C), 3B/C2; 8A/C2
GOA/S/BHA	1A/C4, 1/E1; 2A/C2; 3B/C1(C), 3B/C2; 8A/C2
GOA/S/BON	1A/C4, 1/E1; 2A/C2; 3B/C1(C), 3B/C2; 8A/C2
GOA/S/COT	1A/C4, 1/E1; 2A/C2; 3B/C1(C), 3B/C2; 8A/C2
GUJ/N/GIR	5A/C1(A), 5/DS1, 5/DS2
GUJ/N/MAR	4B/TS1, 4B/TS2; 6B/E4; WETLAND
GUJ/N/VEL	6B
GUJ/S/BAR	6A
GUJ/S/DHR	5/DS2
GUJ/S/DUM	5B/C1(C)
GUJ/S/GIR	5A/C1(E), 5/DS1, 5/DS2
GUJ/S/HIN	6B
GUJ/S/JES	6B
GUJ/S/KHI	WETLAND
GUJ/S/MAR	2B/E4; 4B/TS1, 4B/TS2; WETLAND
GUJ/S/NAL	WETLAND
GUJ/S/NAR	5/DS1, 5/DS2; 6B/C1, 6B/DS2, 6/E2, 6/E4
GUJ/S/RAT	4A/C
HAR/S/SUL	5B, 5/E8(B); WETLAND
HP/N/GRE	12/C1(A), 12/C1(C), 12/C1(D), 12/C1(E), 12/C2(A), 12/C2(B), 12/DS1, 12/DS2, 12/DS3; 14/C1(A), 14/DS1; 15/C1, 15/C2, 15/C3
HP/N/PIN	16/C1, 16/E1
HP/S/BAN	9/C1; 12/C1(A)
HP/S/CHA	9/C1; 12/C1(A), 12/C1(B)
HP/S/DARA	12/C1(C), 12/C1(D), 12/C1(E), 12/C2(A); 13/C1, 13/C2; 14/C1(A); 15/C3
HP/S/DARL	6B/DS2; 12/C1(A)
HP/S/GAM	12/C1(C), 12/C1(D); 15/C3
HP/S/GOB	5B/C2; WETLAND
HP/S/KAL	12/C1(A), 12/C1(C), 12/C1(D); 15/C3
HP/S/KAN	12/C1(A), 12/C1(C), 12/C1(D), 12/C1(E), 12/C2(A); 14/C1(A); 15/C3
HP/S/KHO	12/C1(C), 12/C1(E), 12/C2(A),
HP/S/KUG	12/C1(C), 12/C1(D); 15/C3
HP/S/LIP	12/C1, 12/C2, 12/C2(A); 13/C1, 13/C2; 16/C1, 16/E1
HP/S/MAJ	12/C1(A)

Table II:1.3 (contd)

N/S	Forest types**
HP/S/MAN	12/C1(A), 12/C1(C), 12/C1(D), 12/C1(E), 12/C2(A); 15/C3
HP/S/NAI	5B/C2, 5B/E9; 9/C1(A)
HP/S/NAR	9; 12/C1(A), 12/C1(B), 12/C1(C), 12/C1(D), 12/C1(E), 12/C2(A); 14
HP/S/PON	5B/DS1, 5B/E9; 9/C1; WETLAND
HP/S/RAK	12/C1, 12/C2; 13/C1, 13/C2; 16/C1
HP/S/FEN	5/DS1, 5B/C2
HP/S/RUP	12/C1, 12/C2(A); 13/C1, 13/C2; 15/C3
HP/S/SEC	12/C1; 15; 16
HP/S/SHI	12/C1(A), 12/C1(D), 12/C2(A), 12/C2(B), 12/C2(C); 14; 15/C3
HP/S/SHL	5B; 12/C1(A)
HP/S/SHM	9/C1; 12/C1, 12/C1(A), 12/C1(C), 12/DS1
HP/S/SIM	3C/C2
HP/S/TAL	12/C1, 12/C2(B)
HP/S/THR	12/C1(A), 12/C1(C), 12/C1(D), 12/C1(E), 12/C2(A); 15/C3
HP/S/TUN	12/C1(C), 12/C1(D), 12/C1(E); 15/C3
J&K/N/DAC	12/C1(C), 12/C1(D), 12/C1(E), 12/2S1, 12/DS2, 12/DS3; 13/C2/DS1; 14/C1(A), 14/C1(B); 15/C3
J&K/N/KIS	11; 13/C1, 13/C2(A), 13/C2(B), 13/1S1; 14
J&K/S/NAN	9/C1(A)
J&K/S/OVE	10/C1(B)
J&K/S/RAM	10/C1(B)
J&K/S/SUR	9/C1(A)
KAR/N/BAND	3B/C1, 3B/C2; 5A/C1, 5/DS1
KAR/N/BANN	3B; 5A, 5/DS1, 5/E7
KAR/N/NAG	3B/C2; 5A/C3
KAR/S/ADI	5/DS1
KAR/S/BHA	3B; 5A/C3
KAR/S/BIL	3B/C2
KAR/S/BLA	5/DS1
KAR/S/DAN	3B
KAR/S/GHA	WETLAND
KAR/S/MEL	5A/C1
KAR/S/MOO	1A/C3; 2/E4
KAR/S/NUG	5A
KAR/S/RAN	5/2S1, 5/DS1; WETLAND
KAR/S/SHA	1A/C3; 2/E4
KAR/S/SIE	2A/C2; 3B/C2
KAR/S/SOM	1A/C3; 2/E4
KER/N/ERA	8A/C1, 8A/DS1; 11A/C1
KER/N/PER	1A/C4; 2A/C2; 3B
KER/N/SIL	1A/C4; 2A; 3B/C2; 5A/C3; 8A/C1/E1; 11A/C1/DS2
KER/S/ARA	2A/C2
KER/S/CHIM	1A/C4; 3B/C2; 5A/C3; 11A/C1/DS2
KER/S/IDU	2A/C2; 3B/C2; 11A/C1/DS2
KER/S/NEY	1A/C3, 1A/C4; 2A/C2; 3B/C2; 8A/C1, 8A/C1/DS1, 8A/C1/E1

Table II:1.3 (contd)

N/S	Forest types**
KER/S/PEE	3B/C2/2S1
KER/S/PEP	2A/C2; 3B/C2/2S1
KER/S/PER	1A; 2A/C2; 3B/C2; 4C; 5A/C3
KER/S/SHE	1A/C4; 3
KER/S/THA	1A/C4; 2A/C2; 3B/C1(B)
KER/S/WYN	3, 3B/C1(B)
MAH/N/NAW	5A/C3
MAH/N/PEN	5
MAH/N/SAN	3B/C1, 3B/C2; 4B/TS1; 8A/C2
MAH/N/TAD	5A/C1(B)
MAH/S/BHI	2A/C2
MAH/S/BOR	5A/C1, 5A/C3
MAH/S/DEU	5/DS1
MAH/S/DHA	5A
MAH/S/GRE	6A/C1
MAH/S/KAL	5A/C3
MAH/S/KAR	3B/C2
MAH/S/KIN	5A, 5A/C1(B)
MAH/S/MEL	5A
MAH/S/NAG	5A/C3
MAH/S/RAD	1A/C4; 2A/C2
MAH/S/TAN	3B/C2
MAN/N/KEI	3C; 4C, 4E/RS1
MEG/S/NON	3C/C1(A)(II)
MEG/S/SIJ	2B/C1(B); 3C/C1(A)
MEZ/S/DAM	1B/C; 2B/C1(A); 12/DS1
MP/N/BAN	3C/C2(E)(II), 3C/C3(A)
MP/N/FOS	3B/C1
MP/N/IND	3B/C1(C), 3B/C2; 5A/C3
MP/N/KANG	3C/C1, 3B/C2, 3C/C2(F)
MP/N/KANH	3B/C2(A), 3C/C2(E)
MP/N/MAD	5B/C2
MP/N/PAN	5B/C
MP/N/PEN	5A/C3
MP/N/SAT	5A/C1(A), 5A/C1(B), 5B/C1(C); 8A/C3
MP/N/VAN	3B; 5B/C2
MP/S/ACH	3C/C2(E)(I); 5A/C1(A), 5B/C2, 5/E9
MP/S/BAD	3B/C1(B)
MP/S/BAG	5B/C2
MP/S/BAR	3B/C2
MP/S/BHA	3B/C1(C); 5A/C3
MP/S/BOR	5A/C3
MP/S/GAN	5
MP/S/GHA	5B/C2, 5/DS1, 5/DS4, 5/E5
MP/S/GOM	5B/C2
MP/S/KAR	NO FOREST AREA
MP/S/KEN	WETLAND
MP/S/KHE	5A/C
MP/S/NAR	5A, 5B
MP/S/NAT	WETLAND

Table II:1.3 (contd)

N/S	Forest types**
MP/S/NAU	5A/C1(A), 5A/C1(B), 5A/C3, 5/DS1, 5/DS4, 5/E2, 5/E2
MP/S/PAC	3B/C1; 5A/C1(B), 5B/C1, 5B/C2; 8A/C3
MP/S/PAL	5B/C2
MP/S/PAM	5A, 5B/C2
MP/S/PAN	3C/C2(E)(I), 3C/C3(A); 5B/C2
MP/S/PEN	5A/C1(A), 5A/C3, 5B/C2
MP/S/PHE	3B/C2, 3C/C2(E)
MP/S/RAT	5A/C1(B), 5A/C3, 5/DS1, 5/DS4, 5/1S1, 5/1S3
MP/S/SAI	5A/C1(A), 5/DS4
MP/S/SAN	3C/C2(E)
MP/S/SEM	5B/C1(C)
MP/S/SIT	3C/C3(A); 5B/C1(C), 5C/C2
MP/S/SON	3C/C2; 5A, 5B
MP/S/TAM	5B/C1(C)
MP/S/UDA	5A/C3, 5B/C1(C)
NAG/S/FAK	1B/C2(A); 3C/C1; 12/C1(E)
NAG/S/INT	2B
NAG/S/PUL	1B/C2; 3/1S2
ORI/N/NOR	2B/C3; 3C/C1(D), 3C/C3, 3C/DS1; 5B/C1
ORI/S/BAI	2B/C3; 3C/C2(E)
ORI/S/BAL	4A
ORI/S/BHI	4B/TS1, 4B/TS2, 4B/TS3, 4B/TS4
ORI/S/CHA	5B, 5/E9
ORI/S/DEB	3C; 5B
ORI/S/HAD	2B/C3; 3C/C2(E); 5B/C1(C)
ORI/S/KUL	3C; 5B
ORI/S/NAN	5B
ORI/S/SAT	3C/C2(E); 5B/C2
ORI/S/SIM	2B/C3; 3C/C1(D), 3C/C2(E)(I), 3C/C2(E)(II), 3C/C3, 3C/DS1; 5B/C1(C)
ORI/S/SUN	3B; 5B
ORI/S/USH	3C/C2(E)(I), 3C/C2(E)(II); 5B/C2, 5/E9
RAJ/N/DES	6B/C1
RAJ/N/KEO	5/E3, 5/E5, 5/DS4; WETLAND
RAJ/N/RAN	5B/C2, 5B/E1; 6B/C1
RAJ/N/SAR	5B, 5/E1; 6B
RAJ/S/BHE	5B
RAJ/S/DAR	5/E1
RAJ/S/JAI	5/E1; WETLAND
RAJ/S/JAM	5B/C2
RAJ/S/JAW	5B/C2; 6B; WETLAND
RAJ/S/KAI	5/E2
RAJ/S/KUM	5/E2, 5/E6
RAJ/S/MOU	5B/TS4, 5/E1, 5/E2, 5/E9
RAJ/S/NAH	5B/C2
RAJ/S/NAT	5B/C2; 6B; WETLAND
RAJ/S/PHU	5B
RAJ/S/RAM	5B
RAJ/S/SAR	5B/C2, 5/E1; 6B/DS1
RAJ/S/SHE	5B/C2
RAJ/S/SIT	5A/C1(B), 5/E9
RAJ/S/TAL	5B/C2; 6B

Table II:1.3 (contd)

N/S	Forest types**
RAJ/S/TOD	5/E2
RAJ/S/VAN	5/E1, 5/DS1, 5/DS4
SIK/N/KHA	11B; 12
SIK/S/FAM	11B/C1
TN/N/GUI	7/C1
TN/S/ANA	4A/L1; 5A/C1, 5A/C2
TN/S/KAL	1A/C4; 2A/C3, 2B/C2; 4A: 5A/C3; 8A/E1
TN/S/MUD	2A/C2, 2/E3; 3B/C1(C), 3B/C2; 4E/RS1; 5A/C1(B), 5A/C3; 6A/C1
TN/S/MUN	1A/C3, 1A/C4, 1/2S1; 2A/C3; 3B/C3; 5A/C3; 6A/C2, 6A/DS2; 8A/E1
TN/S/NIL	8A/C1; 11A/C1/DS2
TN/S/POI	4B; 7/C1
TN/S/TUL	WETLAND
TN/S/VED	WETLAND
TN/S/VET	WETLAND
UP/N/COR	3C/C2(A), 3C/C2(B)(D), 3C/C3(A), 3/1S1; 5B/C1(A), 5B/C2, 5/1S2; 9/C1(A)
UP/N/DUD	3B/C1(B), 3C/C3; 5/1S2
UP/N/NAN	12/C1(D), 12/2S1, 12/DS1; 13/1S1; 14/C1; 15/C1, 15/C2(B)(D), 15/C3
UP/N/VAL	12/C1(D); 14/C1, 14/1S1, 14/DS1; 15/C1, 15/C2(B)(D), 15/C3; 16/E1
UP/S/CHA	5A/C3, 5B/C2
UP/S/CHI	3C/C2(B), 3C/C3(A), 3/1S1; 4C/FS2; 5B/C1, 5/1S2
UP/S/GOV	9/C1(B), 9/DS2; 12/C1(A), 12/C1(B), 12/C1(C), 12/C1(D), 12/C1(E)
UP/S/KAI	5A/C3, 5B/C1(B), 5B/C1(C), 5B/C2, 5/DS1, 5/DS3, 5/1S1, 5/E9
UP/S/KED	5B/C2, 5/DS1; 9/C1(B), 9/C1/DS1, 9/C1/DS2; 12/C1(A), 12/C1(B), 12/C1(E), 12/C1/DS1, 12/C1/DS2, 12/C2(A), 12/C2(B), 12/DS3, 12/1S1; 13/1S1; 14/C1(B), 14/DS1, 14/1S1; 15/C1, 15/C2, 15/C3, 15/E1
UP/S/KIS	3C/C2; 5B/C1(B), 5/1S2
UP/S/MOT	5B/C1, 5B/C2
UP/S/NAT	5B, 5/E8(B); 6B/C2
UP/S/NAW	WETLAND
UP/S/RAJ	3C/C2(A), 3C/C2(B), 3C/C3(A), 3/1S1; 5B/C1(A), 5B/C2, 5/1S2; 8B/C1(A)
UP/S/RAN	5A/C3
WB/N/SUN	4B/TS3
WB/S/BET	3C/C3
WB/S/CHA	3C
WB/S/GOR	2B
WB/S/HAL	4B
WB/S/JAL	3/1S1; 5B, 5/DS1, 5/1S2
WB/S/LOT	4B
WB/S/PAR	3C
WB/S/RAM	3C
WB/S/SAJ	4B/TS3
WB/S/SEN	11B/C1

Table II:1.6 Parks/Sanctuaries Connected\* by Forest or other Natural Corridor (Extended Database)

N/S	Name of N/S connected to, and type/name of forest/natural corridor with which connected**
A&N/N/MAR A&N/S/CRO A&N/S/SOU	CROCIDILE (LOHABARRACK) SANCTUARY IS ADJACENT; MOVEMENT OF MARINE FAUNA IS COMMON MARINE NATIONAL PARK IS ADJACENT, WITH FREE MOVEMENT OF WL. CONNECTED TO MARINE NATIONAL PARK BY SEA WATER, TO WHICH MOVEMENT OF MARINE FAUNA IS COMMON
AP/S/ETU AP/S/PAK	CONNECTED TO PAKHAL SANCTUARY BY BANDAL FOREST BLOCK CONNECTED TO ETURNAGARAM SANCTUARY BY BANDAL FOREST BLOCK
BH/S/HAZ BH/S/LAW	CONNECTED TO LAWLONG SANCTUARY CONNECTED BY FOREST CORRIDOR TO HAZARIBAGH SANCTUARY IN EAST AND PALAMAU NATIONAL PARK IN WEST
BH/S/VAL HP/N/TEN HP/S/KHO	NEPAL'S CHITWAN NATIONAL PARK ADJOINING TO NORTH CONNECTED TO RUPBIHABA SANCTUARY TO SOUTH CONNECTED BY RIDGE TO NARGU SANCTUARY, MANDI WL RANGE; MIGRATION TAKES PLACE BETWEEN THE TWO
HP/S/NAR J&K/S/OVE	CONNECTED TO KHOKHAN SANCTUARY IN KULLU DIST TOWARDS EAST CONNECTED TO DACHIGAM NATIONAL PARK BY FOREST CORRIDOR; ALSO TO OVERA-AKU BIOSPHERE RESERVE TO EAST
KAR/N/NAG KAR/S/BRA KAR/S/DAN KAR/S/MOO KAR/S/SHA KAR/S/SOM KER/S/CHIM KER/S/CHIN KER/S/NEY KER/S/PEP KER/S/PER KER/S/SHE KER/S/WYN	CONNECTED TO BANDIPUR NATIONAL PARK, KARNATAKA, AND WYNAD SANCTUARY, KERALA CONNECTED TO NAGARHOLE NATIONAL PARK ON WEST, CONNECTED TO MAHAVER SANCTUARY, GOA CONNECTED TO SOMESWARA SANCTUARY BY TOMBETTU RESERVE FOREST CONNECTED BY CORRIDOR TO MOOKAMBIKA SANCTUARY CONNECTED TO MOOKAMBIKA SANCTUARY BY TOMBETTU RESERVE FOREST CONTIGUOUS WITH PEECHI-VAZHANI SANCTUARY AND CORRIDOR WITH PERAMBILKULAM SANCTUARY CONNECTED TO ANAMALAI SANCTUARY AND ERAVIKULAM NATIONAL PARK CONNECTED TO PEPPARA SANCTUARY, KERALA CONNECTED TO NEYYAR SANCTUARY CONNECTED TO ANAMALAI SANCTUARY OF KERALA TO THE EAST CONNECTED TO MUNDANTHURAI SANCTUARY CONNECTED IN NORTH TO BANDIPUR AND NAGARHOLE NP, KARNATAKA, AND IN SOUTH TO MUDUMALAI SANCTUARY, TN
MAH/N/PEN MAH/S/DEU	PENCH NATIONAL PARK IN DIST CHINDWARA, MP, ADJACENT TO NORTH CONNECTED BY FORESTS AND AGRICULTURAL LAND TO GREAT INDIAN BUSTARD SANCTUARY, SURROUNDING IT
MAH/S/CRE MP/N/BAN	DEULGAON SANCTUARY IS OVERLAPPING CONNECTED WITH PANPATHA SANCTUARY. POSSIBLY ALSO WITH SANJAY NP AND KANHA NP, BEING SURVEYED
MP/N/IND MP/N/KAN MP/N/PAN	CONNECTED TO BHARAMGARH SANCTUARY CONNECTED BY CORRIDOR TO PHEN SANCTUARY TO EAST CONNECTED IN S-W TO NORADEHI SANCTUARY AND IN S-E TO BANDHAVGARH NP; DISTANCES IN BOTH OVER 200 KM

\* This includes areas which are joined by a natural corridor as well as those touching or adjacent to each other

\*\* Information on type/name of corridor not available for all cases

Table II:1.6 (contd.)

N/S	Name of N/S connected to, and type/name of forest/natural corridor with which connected**
MP/N/PEN MP/N/SAN	PENCH SANCTUARY ADJOINING SANJAY (DUBRI) SANCTUARY ADJOINING TO WEST; BANDHAVGARH NATIONAL PARK CONNECTED BY FOREST
MP/N/SAT MP/S/BAG MP/S/BHA MP/S/BOR MP/S/PAC MP/S/PAN MP/S/PEN MP/S/PHE MP/S/RAT MP/S/SAN MP/S/SING ORI/N/SIM	BORI SANCTUARY ON S & S-W AND PACHMARHI SANCTUARY ON E & N-E ARE ADJACENT CONNECTED TO KAIMUR SANCTUARY, MIRZAPUR DIST, U.P. CONNECTED TO INDRAVATI NATIONAL PARK CONNECTED TO SATPURA NATIONAL PARK IN THE NORTH, AND PANCHMARHI SANCTUARY IN THE EAST 35 KM BOUNDARY COMMON WITH SATPURA NATIONAL PARK CONNECTED TO BANDHAVGARH NATIONAL PARK CONNECTED TO PENCH NATIONAL PARK TO WEST, MOVEMENT OF WL COMMON CONNECTED TO KANHA NP TO SOUTH; VAST STRETCHES OF FOREST TO EAST, WEST, AND NORTH CONNECTED TO SINDHORI SANCTUARY BY FOREST CORRIDOR CONNECTED TO SANJAY NATIONAL PARK BY CORRIDOR OF FOREST 0.5 TO 3 KM WIDE AND 5 KM IN LENGTH CONNECTED TO RATAPANI SANCTUARY BY CORRIDOR OF FOREST CONNECTED TO HADGARH SANCTUARY IN SOUTH AND KULIDIHA SANCTUARY IN S-E BY CORRIDOR OF SEVERAL RF
ORI/S/BAI ORI/S/HAD ORI/S/SAT ORI/S/SIM	SATKOSIA GORGE SANCTUARY CLOSE BY # CONNECTED TO SIMLIPAL TIGER RESERVE IN NORTH-WEST CONNECTED TO BAISPALLI SANCTUARY IN SOUTH BY FORESTS OF NAYAGARH DIVISION CONNECTED TO HADGARH SANCTUARY TO SOUTH AND KULIDIHA SANCTUARY IN S-E BY NOTO, BANLA, & SANTSHIPUR RF & GARSABI PROPOSED RF
RAJ/N/SAR RAJ/S/BHE	CONNECTED TO JAMVA-RAMGARH SANCTUARY, JAIPUR DIST, TO SOUTH CONNECTED BY CORRIDOR TO GANDHI SAGAR SANCTUARY 25 KM TO S-W, AND DARAH SANCTUARY, 20 KM TO NORTH
RAJ/S/JAM RAJ/S/JAW	CONNECTED TO SAREKA NATIONAL PARK CONNECTED TO DARAH AND BHAIROADGARH SANCTUARIES; NATIONAL CHAMBAL SANCTUARY DOWNSTREAM
RAJ/S/KAI RAJ/S/KUM	CONNECTED TO RANTHAMBHOR NATIONAL PARK CONNECTED TO TODGARH-RAOLI SANCTUARY BY FOREST; 1 TIGER MIGRATES FROM THERE OCCASIONALLY
RAJ/S/NAT RAJ/S/RAM RAJ/S/SAR RAJ/S/TOD	JAWAHAR SAGAR SANCTUARY IS UPSTREAM; BUT HYDEL STATION ACTS AS BARRIER TO ANIMAL MIGRATION CONNECTED TO RAMTHAMBHOR NATIONAL PARK, 60 KM AWAY ADJOINS JAMVA-RAMGARH SANCTUARY TO SOUTH CONNECTED TO KUMBHALGARH SANCTUARY BY CORRIDOR OF UMERWAS AND GHATDA FOREST BLOCKS, 100 KM AWAY
TN/S/KAL TN/S/MUD TN/S/MUN UP/N/COR	MUNDANTHURAI SANCTUARY CONTIGUOUS TO WEST CONTIGUOUS TO BANDIPUR SANCTUARY, KARNATAKA, & WYNAD SANCTUARY, KERALA 1 MILE CORRIDOR FOR MOVEMENT OF LION-TAILED MACAQUES TO KALAKAD SANCTUARY CONNECTED TO CHILLA SANCTUARY BY LANSDOWN KALAGARH FOREST SUITABLE FOR ELEPHANT MIGRATION
UP/S/MOT UP/S/RAJ	CONNECTED TO RAJAJI AND CHILLA SANCTUARIES CONNECTED TO MOTICHUR AND CHILLA SANCTUARIES

# Precise connection not specified

Table II: 2.1 Incidents of Forest Fire, and Existence of Fire Lines and other Fire-Fighting Measures

1	2	3	4	5	6	7	8	9	10	11	12
State/ U.T.	Total N/S	N/S respon- ding	N/S having fires	4 as % of 3	Total no. of fires	Avg. no of fires per N/S	Range	N/S with fire lines	9 as % of 3	N/S with other measures	11 as % of 3
A&N	N 6 S 5 T 11	5 5 10	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
AP	S&T 15	13	2	15	NA	NA	NA	1	8	0	0
Aru	N 1 S 4 T 5	1 3 4	0 1 1	0 33 25	0 5 5	0 5 5	0 5 5	0 3 3	0 100 75	0 0 1	0 33 25
Blh	S&T 13	8	3	38	*13	13	13	3	38	3	38
Goa	N 1 S 3 T 4	1 3 4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Guj	N 4 S 12 T 16	4 8 12	3 3 6	75 38 50	220 17 237	73 6 40	1212 1-3 1-212	3 3 6	75 38 50	0 1 1	0 13 8
Har	S&T 1	1	0	0	0	0	0	0	0	0	0
HP	N 1 S 29 T 30	0 21 21	13 13	62 62	*23 23	2 2	1-7 1-7	1 1	5 5	0 0	0 0
J&K	N 3 S 6 T 9	1 0 1	1 0 1	100 100	14 14	14 14	14 14	0 0	0 0	0 0	0 0
Kar	N 3 S 14 T 17	2 13 15	1 0 1	50 0 7	103 0 103	103 0 103	103 0 103	2 0 2	100 0 13	1 0 1	50 0 7
Ker	N 3 S 11 T 14	3 8 11	3 1 4	100 13 36	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Mah	N 4 S 22 T 26	3 9 12	3 8 11	100 89 92	192 *236 428	64 34 43	11-162 1-82 1-162	2 5 7	67 56 58	2 4 6	67 44 50
Man	N&T 2	1	1	100	16	16	16	1	100	0	0

\* Data not available from all the areas, thus average (column 7) is not necessarily a ratio of column 6 to column 4.

Table II:2.1 (contd)

1	2	3	4	5	6	7	8	9	10	11	12
State/ U.T	Total N/S	N/S respon- ding	N/S having fires	4 as % of 3	Total no. of fires	Avg. no of fires per N/S	Range	N/S with fire lines	9 as % of 3	N/S with other measures	11 as % of 3
Meg	S&T	2	1	0	0	0	0	0	0	1	100
MP	N	11	6	67	*26	7	2-20	2	33	2	33
	S	31	26	69	101	6	1-32	15	58	7	27
	T	42	32	69	127	6	1-32	17	53	9	28
Nag	S&T	3	0								
Or	N	1	0				3	3	33	2	67
	S	14	6	50	*3	3	3	2	33	2	67
	T	15	6	50	3	3	3	2	33	2	67
Raj	N	4	4	50	3	2	1-2	0	0	1	25
	S	18	14	36	25	5	1-16	4	29	1	7
	T	22	18	39	28	2	1-16	4	22	2	11
Sik	N	1	1	0	0	0	0	0	0	0	0
	S	3	1	0	0	0	0	0	0	0	0
	T	4	2	0	0	0	0	0	0	0	0
TN	N	1	1	0	0	0	0	0	0	0	0
	S	10	7	57	*192	64	53-75	0	0	1	14
	T	11	8	50	192	64	53-75	0	0	1	13
UP	N	4	4	50	NA	NA	NA	2	50	2	50
	S	13	8	50	75	19	1-47	1	13	1	13
	T	17	12	50	75	19	1-47	3	25	3	25
WB	N	1	1	0	0	0	0	0	0	0	0
	S	13	9	0	0	0	0	0	0	0	0
	T	14	10	0	0	0	0	0	0	0	0
ALL INDIA	N	51	38	53	*574	34	1-212	12	32	8	21
	S	242	165	39	*690	12	1-82	38	23	22	13
	T	293	203	42	*1264	17	1-212	50	25	30	15

Table II:2.2 Floods

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- pond- ing	N/S with floods (Nos)	4 as % of 3	Total no. of floods in all N/S	Range of flood incidents per N/S	Loss of wildlife (in no. of floods)	Remedial measures (in no. of N/S)
A&N	N	6	5	0	0			
	S	5	4	0	0			
	T	11	9	0	0			
AP	S&T	15	12	2	17	2	1	6 Birds(1) Tank deepening, bund strengthen- ing (1), Better tank spillway (1)
Aru	N	1	1	0	0			
	S	4	3	0	0			
	T	5	4	0	0			
Bih	S&T	13	8	1	13	2	2	Nil(2) None (1)
Goa	N	1	1	0	0			
	S	3	3	1	33	7	7	Nil(3) Water drain provided (1)
	T	4	4	1	25	7	7	
Guj	N	4	4	1	25	1	1	21 Black Buck (1)
	S	12	7	1	14	5	5	None (1)
	T	16	11	2	18	6	1-5	
Har	S&T	1	1	0	0			
HP	N	1	1	0	0			
	S	29	24	0	0			
	T	30	25	0	0			
J & K	N	3	0					
	S	6	0					
	T	9	0					
Kar	N	3	3	0	0			
	S	14	12	1	8	11	11	Nil(11) None(1)
	T	17	15	1	7	11	11	
Ker	N	3	3	0	0			
	S	11	11	0	0			
	T	14	14	0	0			
Mah	N	4	4	0	0			
	S	22	10	0	0			
	T	26	14	0	0			
Man	N&T	2	1	0	0			

Table II:2.2 (contd)

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- pond- ing	N/S with floods (Nos)	4 as % of 3	Total no. of floods in all N/S	Range of flood incidents per N/S	Loss of wildlife (in no. of floods)	Remedial measures (in no. of N/S)
Meg	S&T	2	2	0	0			
MP	N	11	8	0	0			
	S	31	25	2	8	40	5-35	Nil (35)
	T	42	33	2	6	40	5-35	None (1)
Nag	S&T	3	0					
Ori	N	1	0					
	S	15	7	1	14	7		Islands of con- gregation pro- tected by embankment (1)
	T	16	7	1	14	7		
Raj	N	4	4	0	0			
	S	18	16	2	13	2	1	Nil (1)
	T	22	20	2	10	2	1	None (1)
Sik	N	1	1	0	0			
	S	3	1	0	0			
	T	4	2	0	0			
TN	N	1	1	0				
	S	10	5	1	20			
	T	11	6	1	17			
UP	N	4	4	0	0			
	S	13	8	0	0			
	T	17	12	0	0			
WB	N	1	1	1	100	1	1	5 Deer (1)
	S	13	9	2	22	6	1-5	1 Deer (1), Nil (5)
	T	14	10	3	30	7	1-5	Jetty required, embankment made (1) Jetty required, embankment made (1)
All India	N	51	42	2	5	2	1	Loss (2)
	S	243	168	14	8	82	1-35	No Loss (57), Loss (2)
	T	294	210	16	8	84	1-35	Control measures(1) No measures (5), Control measures(5)

Table II:2.3 Droughts

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- pond- ing	N/S with drought	4 as % of 3	Total no. of droughts in 5 years	Range of times each N/S is affected	Loss of fauna (in no. of cases of drought)	Remedial measures (in no. of N/S with drought)
A&N	N	6	5	0	0			
	S	5	4	0	0			
	T	11	9	0	0			
AP	S & T	15	12	2	17	2	1-1	None (2)
Aru	N	1	1	0	0			
	S	4	3	1	33	2	2	
	T	5	4	1	25	2	2	
Bih	S & T	13	7	0	0			
Goa	N	1	1	0	0			
	S	3	3	1	33	5	5	None (5)
	T	4	4	1	25	5	5	
Guj	N	4	4	0	0			
	S	12	8	1	13	5	5	None (5)
	T	16	12	1	8	5	5	Preserving lake water through the year (1)
Har	S & T	1	0					
HP	N	1	1	0	0			
	S	29	17	5	29	7	1-2	Not known (7)
	T	30	18	5	28	7	1-2	Artificial ponds (2) None (2)
J & K	N	3	0					
	S	6	0					
	T	9	0					
Kar	N	3	2	1	50	1	1	Not known (1)
	S	14	12	2	17	8	3-5	None (8)
	T	17	14	3	21	9	1-5	Bore wells (1) Tanks (2) Bore wells (1)
Ker	N	3	3	0	0			
	S	11	11	0	0			
	T	14	14	0	0			
Mah	N	4	3	0	0			
	S	22	11	1	9	5	5	None (5)
	T	26	14	1	7	5	5	None (1)
Man	N & T		2	1	0	0		
Meg	S & T		2	2	0	0		

Table II:2.3 (contd)

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- pond- ing	N/S with drought	4 as % of 3	Total no. of droughts in 5 years	Range of times each N/S is affected	Loss of fauna (in no. of cases of drought)	Remedial measures (in no. of N/S with drought)
MP	N	11	8	0	0			
	S	31	22	5	23	8	1-3	None (3) Not known (3)
	T	42	30	5	17	8	1-3	Water holes dug (1), Trenches, tanks, dams (1), none (1)
Nag	S & T	3	0					
Ori	N	1	0					
	S	14	7	3	43	11	1-5	Not known (1)
	T	15	7	3	43	11	1-5	Game tanks, Tube well (2) none (1)
Raj	N	4	4	2	50	6	1-5	None (1)
	S	18	15	3	20	7	1-3	Arti. water sources (1) tube wells (1) water holes dug (2), tankers & water hole (1)
	T	22	19	5	26	13	1-5	
Sik	N	1	1	0	0			
	S	3	1	0	0			
	T	4	2	0	0			
TN	N	1	1	1	100	1	1	
	S	10	5	3	60	3	1	None (1)
	T	11	6	4	67	4	1	Tanks, tube well, trough (1) water holes & check dams (1), feeder channels (2)
UP	N	4	4	0	0			
	S	13	5	0	0			
	T	17	9	0	0			
WB	N	1	0					
	S	13	8	1	13	1	1	
	T	14	8	1	13	1	1	Shed for nesting provided (1)
All India	N	51	39	4	10	8	1-5	None (1), Not known (1)
	S	242	153	28	18	64	1-5	None (29), Not known (11)
	T	293	192	32	17	72	1-5	

Table II:2.4 Water Pollution

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having water pollution*	4 as % of 3
A & N	N 6	5	0	0
	S 5	4	0	0
	T 11	9	0	0
AP				
	S & T 15	12	2	17
Aru	N 1	1	0	0
	S 4	3	0	0
	T 5	4	0	0
Bih				
	S & T 13	9	1	11
Goa	N 1	1	0	0
	S 3	3	0	0
	T 4	4	0	0
Guj	N 4	4	1	25
	S 12	8	0	0
	T 16	12	1	8
Har				
	S & T 1	1	0	0
HP	N 1	1	0	0
	S 29	23	1	4
	T 30	24	1	4
J & K	N 3	1	1	100
	S 6	0		
	T 9	1	1	100
Kar	N 3	3	0	0
	S 14	14	1	7
	T 17	17	1	6
Ker	N 3	3	0	0
	S 11	11	0	0
	T 14	14	0	0
Mah	N 4	3	1	33
	S 22	10	0	0
	T 26	13	1	8
Man				
	N & T 2	1	0	0
Meg				
	S & T 2	2	0	0
MP	N 11	9	2	22
	S 31	26	7	27
	T 42	35	9	26

\* Details of each of the national parks and sanctuaries reporting water pollution are given after the table.

Table II:2.4 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having water pollution *	4 as % of 3
Nag S & T		3	0		
Ori	N	1	0		
	S	14	7	3	43
	T	15	7	3	43
Raj	N	4	2	0	0
	S	18	16	3	19
	T	22	18	3	17
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	5	0	0
	T	11	6	0	0
UP	N	4	4	0	0
	S	13	10	1	10
	T	17	14	1	7
WB	N	1	1	1	100
	S	13	9	1	11
	T	14	10	2	20
All India	N	51	41	6	15
	S	242	174	20	11
	T	293	215	26	12

Table II:2.4 (contd)

N/S	Sources of pollution	Nature of pollutants	Water sources polluted	Impact on ecosystem	Preventive measures taken
AP/S/KOL	Agriculture, Industries	Pesticides, Effluents	Entire lake	More weeds and disappearance of some fish and birds	Protest to authorities concerned
AP/S/PUL	Nippo battery factory located at Toda	Chemical effluents	Pulicat lake	Harmful to fish and bird population	None
BIH/S/LAW	Cattle	Mud	Water holes	Wild animals drink dirty water	None
GUJ/N/MAR	Salt works, Oil terminal, Steamers	Chemical effluents, Refuse	Sea all along coast, refuse dumping near Pirouten Island	Damage to marine life	Salt works asked to control effluents, oil leakages being controlled
HP/S/GOB	ACC cement factory, Limestone quarrying, Bilaspur township, Peter India match factory, Winco match factory	#	#	#	#
J & K/N/DAC	Excessive grazing by the livestock of sheep farm	Sheep	Dachigam nalla, main source of water supply to Srinagar city	Destruction of habitat	Reduction in the number of sheep and decreasing the grazing ground area in lower Dachigam
KAR/S/DAN	Paper mill	Effluents from mill	Kali river	Fishes in the river killed; water unfit for drinking	Govt. of Karnataka has taken action to stop pollution
MAH/N/TAD	Cattle and pilgrims from nearby village	#	Lake and surrounds	Yet to be evident; diseases feared	#
MP/N/MAD	Sewer	Urban sewage	Chand Patho lake	Not known	None

# Not specified

Table II: 2.4 (contd)

<i>N/S</i>	<i>Sources of pollution</i>	<i>Nature of pollutants</i>	<i>Water sources polluted</i>	<i>Impact on ecosystem</i>	<i>Preventive measures taken</i>
MP/N/SAN	Agricultural lands	Silt	Rivers and nalas	#	#
MP/S/BAR	Fallen leaves	Germs	Tanks and stagnant water	#	Bleaching powder applied
MP/S/KAR	Cattle	#	Lakes	Not known	None
MP/S/NAR	Agriculture	Insecticides	Matawala Suryawansi	Death of fish	Sowing of certain crops has been stopped
MP/S/NAT	Soil erosion	Soil particles	#	Loss of animal life	Plantation on banks
MP/S/SEM	Cattle	Mud and crowding	Water of nala	#	None
MP/S/SIT	Fallen leaves	Germs	Tank	#	Bleaching powder applied
MP/S/SON	Orient Paper Mills, Amlai	Toxic chemicals	Son river	Decline in population of fish and crocodile	None
ORI/S/BHI	River bank erosion	Silt	60% of area's water sources	Nursery grounds of crustacea and fish affected; predation efficiency of crocodile affected	River bank afforestation with mangrove species begun
ORI/S/HAD	Soil erosion from cultivated land	Silt	Reservoir	Fish resources & aquatic vegetation	None
ORI/S/SAT	Leaf litter	Germs	Water holes and game tanks	Diseases in animals	Small water-holes desilted, treated with potassium permanganate
RAJ/S/JAW	Rajasthan Atomic Power Station	Possible radiation	River	Not known	None
RAJ/S/MOU	Mt. Abu town	Sewage and garbage	Gambhir nala	Polluted water drunk by wild animals	None

Table II: 2.4 (contd)

<i>N/S</i>	<i>Sources of pollution</i>	<i>Nature of pollutants</i>	<i>Water sources polluted</i>	<i>Impact on ecosystem</i>	<i>Preventive measures taken</i>
RAJ/S/NAT	Thermal power plant, Kota;	Effluents	Downstream of Kota	Not known	#
	Shriram Fertiliser and Chemicals, Kota;	Chemical effluents	Barrage	Not known	#
	Rajasthan Atomic Power Plant	Possible radiation	River	Not known	#
UP/S/GOV	Cattle;	Droppings	Supini river	Polluted water supply	#
	Erosion due to grazing	Silt	All streams	Polluted water supply	#
WB/N/SUN	Mechanised boats	Mobile & Diesel oil	Creek water	Not yet noticed	Control of number of boats
WB/S/SAJ	Mechanised boats	Mobile & Diesel oil	#	Not yet noticed	Control of number of boats

Table II:2.5 Occurrence of Hot Winds, Gales and Cyclones, Frost, Hail Storms and Forest Fires

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- pond- ing	N/S with occu- rence	4 as % of 3	Nature of phenomenon specifying numbers				
					Hot winds	Gales & cyclone	Frost	Hail storm	Forest fires
A&N	N 6	5	5	100	0	5	0	0	0
	S 5	5	5	100	0	5	0	2	2
	T 11	10	10	100	0	10	0	2	2
AP	S&T 15	10	6	60	5	1	0	0	0
Aru	N 1	1	1	100	0	0	0	1	0
	S 4	2	2	100	0	1	1	2	1
	T 5	3	3	100	0	1	1	3	1
Bih	S&T 13	9	9	100	7	0	0	6	8
Goa	N 1	1	0	0	0	0	0	0	0
	S 3	3	1	33	0	0	0	0	1
	T 4	4	1	25	0	0	0	0	1
Guj	N 4	4	4	100	2	1	0	0	2
	S 12	10	9	90	9	2	2	0	3
	T 16	14	13	93	11	3	2	0	5
Har	S&T 1	1	1	100	1	1	1	1	0
HP	N 1	1	1	100	0	0	1	1	1
	S 29	26	25	96	3	0	18	15	13
	T 30	27	26	96	3	0	19	16	14
J&K	N 3	1	1	100	0	0	1	0	1
	S 6	1	1	100	0	0	0	1	1
	T 9	2	2	100	0	0	1	1	2
Kar	N 3	3	2	67	0	0	0	1	2
	S 14	13	1	8	1	0	0	1	1
	T 17	16	3	19	1	0	0	2	3
Ker	N 3	3	3	100	0	0	1	0	3
	S 11	11	9	82	1	0	0	0	8
	T 14	14	12	86	1	0	1	0	11
Mah	N 4	4	4	100	2	0	1	0	4
	S 22	10	8	80	4	1	0	1	8
	T 26	14	12	86	6	1	1	1	12
Man	N&T 2	1	1	100	0	0	0	1	1
Meg	S&T 2	2	2	100	0	2	2	2	1
MP	N 11	9	8	89	2	0	2	4	6
	S 31	29	26	90	15	2	8	10	19
	T 42	38	34	89	17	2	10	14	25

Table II:2.5 (contd)

1	2	3	4	5	6	7	8	9	10	
State/ U.T.	Total N/S	N/S res- pond- ing	N/S with occu- rence	4 as % of 3	Nature of phenomenon specifying numbers					
					Hot winds	Gales & cyclone	Frost	Hail storm	Forest fires	
Nag	S&T	3	1	1	100	0	1	0	1	0
Ori	N	1	0							
	S	14	6	5	83	1	3	1	1	2
	T	15	6	5	83	1	3	1	1	2
Raj	N	4	4	4	100	4	1	4	1	2
	S	18	18	15	83	13	5	5	4	8
	T	22	22	19	86	17	6	9	5	10
Sik	N	1	0							
	S	3	1	1	100	0	0	1	1	0
	T	4	1	1	100	0	0	1	1	0
TN	N	1	1	1	100	0	1	0	0	0
	S	10	6	4	67	1	1	0	0	4
	T	11	7	5	71	1	2	0	0	4
UP	N	4	4	4	100	1	0	3	3	1
	S	13	12	12	100	9	1	5	3	8
	T	17	16	16	100	10	1	8	6	9
WB	N	1	1	0	0	0	0	0	0	0
	S	13	8	8	100	7	6	1	4	3
	T	14	9	8	89	7	6	1	4	3
All India	N	51	43	39	91	11	8	13	12	23
	S	242	184	151	82	77	32	45	55	91
	T	293	227	190	84	88	40	58	67	114

Table II: 2.6 Waterlogging and Other Abnormal Physical Occurrences

1	2	3	4	5	6	7	8
State/ U.T.	Total N/S	N/S res- ponding	N/S with water logging	4 as % of 3	N/S with other problems	6 as % of 3	Nature of other problems
A & N	N 6	5	0	0	0	0	
	S 5	4	0	0	0	0	
	T 11	9	0	0	0	0	
AP	S & T 15	12	0	0	4	33	Fires, cyclonic storms
Aru	N 1	1	0	0	0	0	
	S 4	3	0	0	1	33	Soil erosion and gully formation
	T 5	4	0	0	1	25	
Bih	S & T 13	8	1	13	2	25	Drought
Goa	N 1	1	0	0	1	100	Landslides
	S 3	2	0	0	2	100	Floods, droughts
	T 4	3	0	0	3	100	
Guj	N 4	4	0	0	2	50	Fires, cyclones, heavy rains
	S 12	9	1	11	3	33	Droughts, wind
	T 16	13	1	8	5	38	
Har	S & T 1	1	0	0	0	0	
HP	N 1	1	0	0	1	100	Avalanche, landslide, cloud burst
	S 29	24	0	0	12	50	Fires, droughts, siltation, landslides, snow, shortage of food for animals
	T 30	25	0	0	13	52	
J & K	N 3	1	0	0	1	100	Cloud bursts
	S 6	1	0	0	0	0	
	T 9	2	0	0	1	50	
Kar	N 3	3	0	0	0	0	
	S 14	14	0	0	2	14	Fires, floods
	T 17	17	0	0	2	12	
Ker	N 3	2	0	0	0	0	
	S 11	11	0	0	0	0	
	T 14	13	0	0	0	0	
Mah	N 4	4	1	25	0	0	
	S 22	10	0	0	1	10	Fires
	T 26	14	1	7	1	7	
Man	N & T 2	1	0	0	0	0	
Meg	S & T 2	2	0	0	0	0	

Table II: 2.6 (contd)

1	2	3	4	5	6	7	8
State/ U.T.	Total N/S	N/S res- ponding	N/S with water logging	4 as % of 3	N/S with other problems	6 as % of 3	Nature of other problems
MP	N 11 S 31 T 42	9 24 33	0 0 0	0 0 0	0 2 2	0 8 6	Fires
Nag	S & T 3	1	0	0	0	0	
Ori	N 1 S 14 T 15	0 5 5	0 0 0	0 0 0	2 2 2	40 40 40	Floods, heavy rains, siltation, Soil erosion, cyclones, droughts
Raj	N 4 S 18 T 22	4 15 19	0 0 0	0 0 0	2 4 6	50 27 32	Droughts Droughts, fires, soil erosion
Sik	N 1 S 3 T 4	1 1 2	0 0 0	0 0 0	1 0 1	100 0 50	Avalanches
TN	N 1 S 10 T 11	1 5 6	0 0 0	0 0 0	0 2 2	0 40 33	Droughts, polluted and stagnant water
UP	N 4 S 13 T 17	4 11 15	0 0 0	0 0 0	2 1 3	50 9 20	Weeds, avalanches Fire
WB	N 1 S 13 T 14	1 8 9	0 1 1	0 13 11	0 2 2	0 25 22	Changing river course, snow, landslides, earthquakes, frost
All India	N 51 S 242 T 293	43 171 214	1 3 4	2 2 2	10 40 50	23 23 23	

Table III: 1.1 Human Population in and around Parks/Sanctuaries

	1	2	3	4	5	6	7	8	9	10	11	12
State/ U.T.	Inside						Surrounding areas					
	Total N/S	N/S res- pond- ing	N/S with pop.	N/S with pop.	4 as % of 3	Total popula- tion *	Ave. pop. per N/S *	N/S res- pond- ing	N/S with pop.	9 as % of 8	Total popula- tion *	Ave. pop. per N/S *
A & N	N 6	4	0	0	0	0	0	4	0	0	0	0
	S 5	4	0	0	0	0	0	4	0	0	0	0
	T 11	8	0	0	0	0	0	8	0	0	0	0
AP												
S & T	15	13	8	62	300521	42932	9	9	100	357000	39667	
Aru	N 1	1	0	0	0	0	0	0				
	S 4	4	2	50	100	100	2	2	100	7760	3880	
	T 5	5	2	40	100	100	2	2	100	7760	3880	
Bih												
S & T	13	9	8	89	84170	10521	7	7	100	48150	31164	
Goa	N 1	0					0					
	S 3	2	1	50	1166	1166	2	2	100	27100	13550	
	T 4	2	1	50	1166	1166	2	2	100	27100	13550	
Gj	N 4	4	2	50	1460	730	1	1	100	7000	7000	
	S 12	8	3	38	8061	2672	9	7	78	99314	14188	
	T 16	12	5	42	9521	1904	10	8	80	106314	21263	
Har												
S & T	1	1	0	0	0	0	1	1	100	NA	NA	
HP	N 1	1	1	1	100	NA +	NA	1	1	100	NA	NA
	S 29	14	11	79	97727	8884	9	5	56	92399	18480	
	T 30	15	12	80	97727	8884	10	6	60	92399	18480	
J & K	N 3	0					1	1	100	NA	NA	NA
	S 6	1	1	1	100	1050	1050	1	1	100	5000	5000
	T 9	1	1	1	100	1050	1050	2	2	100	5000	5000

\* The total and average is of those N/S for which population figures are available, the number of which may be less than the number which have been reported as having population (column 4).

+ NA not available

Table III: 1.1 (contd)

1	2	3	4	5	6	7	8	9	10	11	12
State/ U.T.	Total N/S	Inside			Surrounding areas						
		N/S res- pond- ing	N/S with pop.	4 as % of 3	Total popula- tion *	Ave. pop. per N/S *	N/S res- pond- ing	N/S with pop.	9 as % of 8	Total popula- tion *	Ave. pop. per N/S *
Kar	N 3	2	1	50	NA	NA	2	2	100	23700	23700
	S 14	12	6	50	68475	11413	13	8	62	308180	38523
	T 17	14	7	50	68475	11413	15	10	67	331880	36876
Ker	N 3	3	2	67	2090	1045	0				
	S 11	6	4	67	2500	833	4	4	100	6000	6000
	T 14	9	6	67	4590	918	4	4	100	6000	6000
Mah	N 4	4	3	75	20465	10233	4	4	100	14126	14126
	S 22	7	5	71	49197	12299	6	6	100	58484	14621
	T 26	11	8	73	69662	11610	10	10	100	72610	14522
Man	N & T 2	1	0	0	0	0	1	1	100	35300	35300
Meg	S & T 2	2	0	0	0	0	2	2	100	13500	6750
MP	N 11	7	6	86	18257	4564	5	5	100	56886	28443
	S 31	23	22	96	236192	11809	22	22	100	1131101	59532
	T 42	30	28	93	254449	10602	27	27	100	1187987	56571
Nag	S & T 3	0					0				
Orh	N 1	0					0				
	S 14	5	5	100	248937	49787	6	6	100	431032	86206
	T 15	5	5	100	248937	49787	6	6	100	431032	86206
Raj	N 4	2	2	100	^1799	899	2	2	100	N/A	N/A
	S 18	8	8	100	252100	31513	14	14	100	@1916980	147460
	T 22	10	10	100	253899	25390	16	16	100	1916980	147460

^ This includes data from Ranthambhor NP given as 243 families, converted here into a figure of 1215 persons, using 5 persons per family as an average.

@ Of which 12 lakhs is surrounding National Chambal Sanctuary—the average for the rest is 59748 persons.

Table III: 1.1 (contd.)

1	2	3	4	5	6	7	8	9	10	11	12
State/ U.T.	Inside			Surrounding areas							
	Total N/S	N/S res- pond- ing	N/S with pop.	4 as % of 3	Total popula- tion *	Ave. pop. per N/S *	N/S res- pond- ing	N/S with pop.	9 as % of 8	Total popula- tion *	Ave. pop. per N/S *
Sik	N 1	0					0				
	S 3	0					0				
	T 4	0					0				
TN	N 1	0					0				
	S 10	4	4	100	27550	9183	4	4	100	210783	70261
	T 11	4	4	100	27550	9183	4	4	100	210783	70261
UP	N 4	2	1	50	16500	16500	2	2	100	100000	100000
	S 13	8	7	88	107304	21461	9	9	100	51852	12963
	T 17	10	8	73	123804	20634	11	11	100	151852	30370
WB	N 1	1	0	0	0	0	0				
	S 13	8	5	63	49300	9860	8	6	75	522700	87117
	T 14	9	5	56	49300	9860	8	6	75	522700	87117
All											
India	N 51	32	18	56	60571	4659	23	19	83	237012	33859
	S 242	139	100	72	1534350	15861	132	115	87	5287335	55656
	T 293	171	118	69	1594921	15336	155	134	86	5524347	54697

Table III:1.1a Density of Population Inside Parks/Sanctuaries\*  
(Extended Database)

<i>N/S</i>	<i>Area (ha)</i>	<i>Population (1981 census)</i>	<i>Density (persons per ha)</i>
WB/S/BAL	202.00	23500	116.34
MAH/S/BOR	104.32	2045	19.60
MP/S/PAN	245.84	4500	18.30
KAR/S/BLA	11900.00	110000	9.24
J&K/S/JAS	912.00	7500	8.22
BIH/S/DAL	19322.10	98073	5.08
RAJ/S/RAJ	30700.00	150000	4.89
KER/S/SHE	10032.00	40000	3.99
HP/S/GAM	900.75	3039	3.37
J&K/S/RAJ	1130.00	3800	3.36
BIH/S/TOP	1282.00	3188	2.49
TN/S/POI	1728.76	4005	2.32
J&K/S/SUR	3912.00	8500	2.17
ORI/S/BHI	65000.00	139190	2.14
MP/S/BAD	10455.43	22000	2.10
MP/S/KHE	12270.00	22500	1.83
RAJ/S/BHE	22194.00	40000	1.80
HP/S/KAL	4728.00	7536	1.59
WB/S/JAL	11562.72	18000	1.56
BIH/S/HAZ	18323.00	25400	1.39
AP/S/SIW	3020.00	4000	1.32
MAH/S/NAG	15281.00	20000	1.31
KAR/S/SOM	8840.00	11045	1.25
MAH/S/TAN	21675.00	26000	1.20
ORI/S/SAT	79552.00	88000	1.11
MAH/S/GRE	781847.00	835793	1.07
MP/S/GHA	51200.00	54000	1.05
MAH/S/KIN	21876.00	23000	1.05
UP/S/KAT	40009.00	40450	1.01
HP/S/PON	50000.00	50000	1.00
ORI/S/BAI	16641.00	14500	0.87
HP/S/TAL	2610.00	2250	0.86
RAJ/S/SHE	9800.00	8000	0.82
J&K/S/NAN	1349.80	1050	0.78
BIH/S/LAW	21103.34	15000	0.71
GUJ/S/RAT	5565.00	3861	0.69
HP/S/TUN	6422.00	4358	0.68
KAR/S/SHE	39567.00	23250	0.59
KAR/S/SHA	43123.00	25000	0.58
GUJ/N/BAN	2399.44	1335	0.56
GUJ/S/DUM	15087.00	8431	0.56
RAJ/S/MOU	28884.00	16000	0.55
MP/S/KHA	34812.18	18447	0.53

\* N/S listed in descending order of density, down to a density of 0.01 persons per ha.

Table III:1.1a (contd)

N/S	Area (ha)	Population (1981 census)	Density (persons per ha)
RAJ/S/PHU	51141.00	26000	0.51
AP/S/PRA	13602.00	7000	0.51
GUJ/S/NAR	30754.53	15000	0.49
BIH/S/GAU	25947.92	11500	0.44
MAH/N/PEN	47645.00	20015	0.42
MP/S/BAG	47800.00	20107	0.42
MP/S/PAC	47216.00	17000	0.36
KAR/S/MOO	24700.00	8500	0.34
UP/S/RAN	23031.00	7500	0.33
MP/S/SEM	43036.12	14000	0.33
KAR/S/DAN	572907.00	175000	0.31
MAH/S/DHA	38158.90	11142	0.29
BIH/S/PAL	92800.00	25982	0.28
UP/N/DUD	61431.00	16500	0.27
ORI/S/HAD	19160.00	5000	0.26
MP/S/BAR	24466.00	6189	0.25
KAR/N/NAG	57155.00	13184	0.23
GUJ/S/BAR	18025.00	4000	0.22
AP/S/KAW	89228.00	20000	0.22
TN/S/ANA	95498.00	20925	0.22
MP/S/NAR	5719.70	1200	0.21
MP/S/SING	28791.00	5667	0.20
RAJ/S/DAR	26583.00	5000	0.19
HP/S/RUP	12486.00	2420	0.19
AP/S/PAK	89205.00	17000	0.19
HP/S/SEC	14865.00	2623	0.18
MP/S/NAU	118696.10	20270	0.17
MP/S/BHA	13895.00	2250	0.16
MP/S/RAT	66580.00	10713	0.16
UP/S/GOV	95312.00	15000	0.16
MP/S/GOM	27782.00	4237	0.15
AP/S/ETU	81259.00	12100	0.15
UP/S/CHI	24892.00	3604	0.14
RAJ/S/SIT	42294.00	5100	0.12
MP/S/BOR	48277.74	5082	0.11
RAJ/N/SAR	27380.00	2920	0.11
TN/S/MUN	56700.00	6450	0.11
GOA/S/COT	10500.00	1166	0.11
AP/S/NAG	356890.00	34389	0.10
AP/S/PAP	59068.00	6032	0.10
MP/S/PAL	34468.60	3512	0.10
HP/S/KAN	6070.00	460	0.08
KER/S/PEP	5300.00	400	0.08
MP/S/UDA	24759.00	2025	0.08
HP/S/KUG	11828.00	896	0.08
MP/S/ACH	55155.00	3900	0.07
BIH/S/VAL	46160.00	3000	0.06

Table III:1.1a (contd)

N/S	Area (ha)	Population (1981 census)	Density (persons per ha)
ORI/S/CHA	22000.00	1247	0.06
KER/S/CHIN	9000.00	500	0.06
MP/S/TAM	60852.00	3500	0.06
RAJ/S/SAR	49200.00	2920	0.06
MP/N/KAN	93994.00	4412	0.05
MP/N/BAN	44884.00	1584	0.04
MP/S/SIT	553800.00	19431	0.04
HP/S/BAN	3130.00	115	0.04
KER/S/PER	27100.00	1200	0.04
MP/N/SAN	193801.00	8000	0.04
MP/S/GAN	22098.60	800	0.04
J&K/N/KIS	40000.00	1005	0.03
RAJ/N/RAN #	39220.00	1215	0.03
MAH/N/NAW	13380.00	450	0.03
ARU/S/MEH	28150.00	974	0.03
RAJ/S/KUM	57825.86	2000	0.03
KER/N/PER	77700.00	2000	0.03
ORI/S/SIM	244700.00	6000	0.02
TN/S/MUD	32100.00	750	0.02
MP/S/SAN	364593.00	7680	0.02
MP/S/PHE	11074.00	189	0.02
MP/N/SAT	50244.00	800	0.02
GUJ/N/MAR	16289.00	125	0.01
UP/S/KIS	20021.00	250	0.01
KAR/S/BHA	49246.00	680	0.01
HP/N/PIN	182500.00	1258	0.01
MP/N/PAN	542666.00	3601	0.01

# Population figure reported as 243 families, converted here into a figure of 1215 persons on an average of 5 members per family

**Table III:1.1b Density of Human Population in Core Zone \***  
(Extended Database)

<i>N/S</i>	<i>Area of core zone (ha)</i>	<i>Population of core zone (1981 census)</i>	<i>Density (persons per ha)</i>
WB/S/BAL	40.00	23500	587.50
KAR/S/BLA	1440.00	82800	57.50
BIH/S/DAL	3823.02	16500	4.32
MAH/S/KIN	8442.00	26000	3.08
HP/S/KAL	1962.84	1776	0.90
MAH/S/BOR	61.10	45	0.74
KAR/S/SHA	22747.00	11000	0.48
BIH/S/GAU	3515.52	1500	0.43
MAH/N/PEN	25723.70	10144	0.39
KAR/S/SHE	10062.00	1250	0.12
HP/S/SEC	10295.00	1240	0.12
MAH/S/TAN	9318.13	1000	0.11
MP/S/BOR	15545.74	1484	0.10
TN/S/MUD	8400.00	750	0.09
BIH/S/IIAZ	4353.00	400	0.09
KAR/S/SOM	3626.00	245	0.07
AP/S/ETU	28807.00	1100	0.04
AP/S/PAK	23827.00	1000	0.04
MP/N/IND	125837.20	5456	0.04
RAJ/S/SAR	27380.00	1160	0.04
BIH/S/PAL	20100.00	542	0.03
KAR/N/NAG	18385.00	300	0.02
AP/S/NAG	120000.00	1434	0.01
UP/N/DUD	49029.16	500	0.01
AP/S/KIN	22200.00	210	0.01

\* N/S listed in descending order of density, down to a density of 0.01 persons per ha.

Table III.1.1c Density of Human Population in Buffer Zone \*  
(Extended Database)

N/S	Area of buffer zone (ha)	Population of buffer zone (1981 census)	Density (persons per ha)
MAH/S/BOR	43.22	2000	46.27
HP/S/KAL	800.00	5760	7.20
BIH/S/DAL	15499.08	81573	5.26
KAR/S/BLA	10460.00	27200	2.60
HP/S/PON	20000.00	50000	2.50
KAR/S/SOM	5214.00	10800	2.07
MAH/S/TAN	12356.87	25000	2.02
BIH/S/HAZ	13970.00	25000	1.79
UP/N/DUD	12402.51	16000	1.29
MAH/S/KIN	13434.00	17000	1.27
KAR/S/SHA	11376.00	14000	1.23
KAR/S/SHE	20498.00	22000	1.07
KAR/S/MOO	14988.00	8500	0.57
BIH/S/GAU	22432.40	10000	0.45
MAH/N/PEN	21921.70	9871	0.45
MP/S/BAG	47330.59	20107	0.42
BIH/S/PAL	72700.00	25440	0.35
HP/S/SEC	4570.00	1383	0.30
KAR/N/NAG	48770.00	12884	0.26
MP/S/RAT	43540.00	10713	0.25
AP/S/PAK	65378.00	16000	0.24
AP/S/ETU	52452.00	11000	0.21
AP/S/NAG	236890.00	32955	0.14
BIH/S/VAL	23105.00	3000	0.13
MAH/S/MEL	128899.00	16169	0.13
MP/S/BOR	32732.00	3598	0.11
MP/S/GAN	17701.54	800	0.05
KER/N/PER	37700.00	2000	0.05
RAJ/S/SAR	49200.00	1760	0.04
MP/S/SAN	322481.00	7680	0.02
KAR/S/BHA	34742.00	680	0.02
HP/N/PIN	115000.00	1258	0.01

\* N/S listed in descending order of density, down to a density of 0.01 persons per ha.

Table III:1.1d Index of Population Pressure Adjacent to N/S\*  
(Extended Database)

N/S	Area of N/S (ha)	Population adjacent (1981 census)	Index (persons per ha of N/S)
WB/S/AM	14.47	386000	26675.88
MAH/S/KAR	448.00	1000000	2232.14
KAR/S/RAN	26.00	15000	576.92
MAH/S/BOR	104.32	25000	239.65
WB/S/BAL	202.00	35700	176.73
MP/S/SAI	1296.54	100000	77.13
MP/N/VAN	445.21	30000	67.38
GUJ/S/HIN	654.00	40836	62.44
MP/S/PAN	245.84	15000	61.02
GUJ/S/KHI	604.00	34561	57.22
RAJ/S/NAT	54900.00	1200000	21.86
KAR/N/BANN	10434.82	200000	19.17
TN/S/POI	1728.76	26570	15.37
BIH/S/RAJ	3545.00	50000	14.10
GOA/S/BON	800.00	10600	13.25
KAR/S/GHA	2978.00	35000	11.75
J&K/S/JAS	912.00	8500	9.32
AP/S/POC	12963.57	120000	9.26
MAN/N/KEI	4000.00	35300	8.82
MP/S/GHA	51200.00	415000	8.11
A&N/S/MEG	12.00	95	7.92
RAJ/S/DAR	26583.00	210000	7.90
AP/S/NEE	453.00	3000	6.62
MAH/S/NAG	15281.00	100000	6.54
MAH/N/NAW	13380.00	86604	6.47
MP/S/SING	28791.00	164000	5.70
CHA/S/SUK	2542.00	14500	5.70
KAR/S/SOM	8840.00	50000	5.66
J&K/S/AM	1130.00	6000	5.31
BIH/S/TOP	1282.00	6150	4.80
TN/S/KAL	22358.00	100000	4.47
ORI/S/HAD	19160.00	80000	4.18
MP/N/KANG	20000.00	81212	4.06
RAJ/S/SHE	9800.00	37000	3.78
RAJ/S/JAM	30000.00	111000	3.70
J&K/S/NAN	1349.80	5000	3.70
GUJ/S/RAT	5565.00	20850	3.66
ORI/S/BHI	65000.00	220432	3.39
HP/S/GAM	900.75	3039	3.37
MEG/S/SIJ	518.00	1500	2.90
KER/S/PEP	5300.00	15000	2.83
KAR/S/SHE	39567.00	108080	2.73

\* N/S listed in descending order of index numbers, down to an index of 0.01 persons per ha. The index here refers to the number of people adjacent (i.e. within a 10-km radius) to a national park or sanctuary, per hectare of that national park or sanctuary.

Table III:1.1d (contd)

N/S	Area of N/S (ha)	Population adjacent (1981 census)	Index (persons per ha of N/S)
BIH/S/HAZ	18323.00	50000	2.73
RAJ/S/JAW	10000.00	27000	2.70
RAJ/S/KUM	57825.86	150000	2.59
WB/S/JAL	11562.72	30000	2.59
GUJ/S/NAL	12082.00	29403	2.43
J&K/S/SUR	3912.00	9000	2.30
MP/S/BAD	10455.43	24000	2.30
MP/N/KAN	93994.00	211613	2.25
AP/S/PRA	13602.00	30000	2.21
MP/S/KEN	4500.00	9632	2.14
RAJ/S/JAI	5200.00	10980	2.11
GUJ/N/VEL	3408.00	7000	2.05
MP/S/BAR	24466.00	50000	2.04
ORI/N/SIM	30300.00	61000	2.01
MP/S/NAT	42300.00	80000	1.89
MP/S/PEN	11847.30	21972	1.85
MP/S/KHE	12270.00	22500	1.83
MAH/S/RAD	1961.00	3484	1.78
AP/S/PUL	58000.00	100000	1.72
MP/N/MAD	15600.00	26886	1.72
HP/S/PON	50000.00	85000	1.70
TN/S/MUN	56700.00	95783	1.69
RAJ/S/RAM	30700.00	50000	1.63
UP/N/DUD	61431.00	100000	1.63
GOA/S/COT	10500.00	16500	1.57
BIH/S/VAL	46160.00	70000	1.52
BIH/S/LAW	21103.34	30000	1.42
AP/S/SIW	3020.00	4000	1.32
RAJ/S/MOU	28884.00	36000	1.25
MP/S/RAT	66580.00	70317	1.06
KAR/S/MOO	24700.00	26000	1.05
KAR/N/NAG	57155.00	55283	0.97
MP/S/KHA	34812.18	32213	0.93
MAH/S/TAN	21675.00	20000	0.92
RAJ/S/BHE	22194.00	20000	0.90
ORI/S/BAI	16641.00	14500	0.87
MEG/S/NON	12000.00	10200	0.85
RAJ/S/SIT	42294.00	35000	0.83
GUJ/S/BAR	18025.00	15000	0.83
WB/S/SAJ	36236.00	30000	0.83
MP/S/PHE	11074.00	8879	0.80
ORI/S/SAT	79552.00	61100	0.77
UP/S/RAN	23031.00	16900	0.73
UP/S/CHI	24892.00	16952	0.68
MAH/S/GRE	781847.00	531545	0.68
MP/S/BOR	48277.74	32000	0.66

Table III:1.1d (contd)

N/S	Area of N/S (ha)	Population adjacent (1981 census)	Index (persons per ha of N/S)
KAR/S/DAN	572907.00	375000	0.65
AP/S/COR	23570.00	15000	0.64
MP/S/PAC	47216.00	25000	0.53
MAH/S/KAL	36181.00	18594	0.51
KAR/S/BHA	49246.00	25000	0.51
MP/S/NAU	118696.10	56636	0.48
MP/S/BAG	47800.00	22934	0.48
TN/S/MUD	32100.00	15000	0.47
BIH/S/GAU	25947.92	12000	0.46
MP/S/SEM	43036.12	18000	0.42
RAJ/S/TOD	49528.00	20000	0.40
AP/S/ETU	81259.00	30000	0.37
AP/S/KAW	89228.00	33000	0.37
MP/S/TAM	60852.00	20500	0.34
HP/S/TUN	6422.00	1980	0.31
MAH/N/PEN	47645.00	14126	0.30
ARU/S/LAL	19000.00	5260	0.28
AP/S/PAK	89205.00	25000	0.28
KAR/N/BAN	86573.00	23700	0.27
KAR/S/SHA	43123.00	11000	0.26
GUJ/S/NAR	30754.53	7500	0.24
ARU/S/MEH	28150.00	6726	0.24
ORI/S/SIM	244700.00	55000	0.22
KER/S/PER	27100.00	6000	0.22
RAJ/S/PHU	51141.00	10000	0.20
MAN/N/SIR	10000.00	2000	0.20
UP/S/KAT	40009.00	8000	0.20
MP/S/GAN	22098.60	4200	0.19
AP/S/KIN	63540.00	11000	0.17
MAH/S/KIN	21876.00	3000	0.14
GUJ/S/DHR	484090.00	62628	0.13
HP/S/SEC	14865.00	1470	0.10
MP/S/ACH	55155.00	5300	0.10
MP/S/SIT	553800.00	50000	0.09
MIZ/S/DAM	68100.00	5800	0.09
A&N/S/CRO	10200.00	893	0.09
HP/S/KUG	11828.00	910	0.08
A&N/N/MAR	28150.00	2364	0.08
ARU/N/NAM	180782.00	5830	0.03
ARU/S/PAK	86195.00	2500	0.03
KER/S/PEE	8365.00	100	0.01

Table III-1.2 Rights and Leases

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38							
State/ U.T.	Total N/S	No. of N/S res- pond- ing	No. of N/S with rights	% of N/S with rights	No. of N/S	6 as % of 4	6 as % of 3	No. of N/S	9 as % of 4	9 as % of 3	No. of as % of 4	12 as % of 3	No. of as % of 3	No. of as % of 3	15 as % of 4	15 as % of 3	No. of as % of 3	18 as % of 4	18 as % of 3	Rel. Years**	21	22	23	24	25	26	27	28	29	30	31	32	No. of as % of 3	No. of as % of 3	Timber	34	35	No. of as % of 3	36	37	Quarrying	38		
A&N	N 6 S 5 T 11	5 4 9	0 0 0	0 0 0																																								
AP	S&T 14	14	13	93	10	77	71	6	46	43	9	69	64	3	23	21	4	30	29	2	15	14	1	8	7	1	8	7																
Arun	N 1 S 4 T 5	1 4 5	0 2 2	0 50 40	1	50	25	1	50	25	2	100	50	1	50	25	1	50	25	1	50	25	2	100	50	40	1	50	25	1	50	25	1	50	25	1	50	25	1	50	25	1	50	25
Bih	S&T 13	9	7	78	5	71	56				2	29	22				1	14	11	3	43	33	3	43	33	3	43	33					2	29	22									
Goa	N 1 S 3 T 4	1 3 4	0 0 0	0 0 0																																								
Guj	N 4 S 12 T 16	3 5 8	1 3 4	33 60 50	1	100	33	1	100	33	1	33	20	1	100	33	1	100	33	2	67	40	2	67	40	2	67	40	2	67	40	2	67	40	2	67	40	2	67	40	2	67	40	
Har	S&T 1	1	0	0																																								
HP	N 1 S 28 T 29	1 28 29	1 25 26	100 89 90	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	1	100	100	
J&K	N 3 S 6 T 9	2 4 6	2 4 6	100 100 100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	2	100	100	

Notes: \* MRP - Minor Forest Produce  
\*\* Rel - Religious

Table III: 1.2 (cont'd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
State/ U.T.	Total N/S	No. of N/S	No. of N/S with rights	% of N/S with rights	No. of N/S	6 as % of 4	6 as % of 3	No. of N/S	9 as % of 4	9 as % of 3	No. of N/S	12 as % of 4	12 as % of 3	No. of N/S	15 as % of 4	15 as % of 3	No. of N/S	18 as % of 4	18 as % of 3	No. of N/S	21 as % of 4	21 as % of 3	No. of N/S	24 as % of 4	24 as % of 3	No. of N/S	27 as % of 4	27 as % of 3	No. of N/S	30 as % of 4	30 as % of 3	No. of N/S	33 as % of 4	33 as % of 3	No. of N/S	36 as % of 4	36 as % of 3		
Kar	N 3 S 14 T 17	3 14 7	1 8 0	33 57 53		7 88 78	50 41	2 25 2	14 14 12	1 1 1	13 11	7 6	5 5 5	63 36 29	3 3 3	38 21 18	1 4 5	100 50 56	33 29 29																				
Ker	N 3 S 14	3 14	1 5 6	33 50 46				1 1 2	100 20 33	33 10 15	3 3 3	60 20 50	30 10 23	#1 2 2	100 20 33	2 2 2	40 20 33	1 1 2	100 20 33	33 10 15																			
Mah	N 4 S 10 T 14	4 10 12	3 1 4	75 13 33		1 1 2	33 100 16	25 13 16			2 1 3	67 100 75	50 13 25	1 1 1	100 13 8																								
Man	N & T 2	2	1	0	0																																		
Meq	S & T 2	2	0	0																																			
MP	N 11 S 31 T 42	10 29 39	6 26 32	60 90 82		4 24 28	67 92 87	40 83 22	1 4 3	3 3 12	2 10 37	33 38 31	20 3 31	5 12 17	83 46 53	50 41 44	5 11 16	83 42 50	50 40 41	2 3 5	33 12 16	20 10 13	3 16 19	50 62 59	30 55 49	1 4 5	17 15 16	10 14 13	2 6 8	33 23 25	20 21 20		2	8	7	2	8	7	5
Nag	S & T 3	3																																					
Orl	N 1 S 14 T 15	0 7 7	4 4 4	57 57 57		2 2 2	50 29 50	29 29 29	3 75 43	43 43 2	2 50 50	29 29 29	2 2 2	50 29 29	4 4 4	100 57 57	1 1 1	25 14 14	2 2 2	50 29 29	2 2 2	50 50 50	29 29 29	2 2 2	50 29 29	2 2 2	50 50 50	29 29 29	2 2 2	50 50 50	29 29 29	1 1 1	25 14 14	2 2 2	50 50 50	29 29 29			
Raj	N 4 S 18 T 22	4 17 21	2 13 15	50 76 71		2 13 15	100 100 100	50 76 71	1 8 7	6 6 5	3 3 3	23 18 14	18 4 5	4 30 33	24 24 24	2 4 6	100 30 40	50 24 29	2 9 11	100 69 73	50 53 52	1 12 13	50 92 87	25 70 62	2 5 7	100 38 47	50 29 33	1 1 1	25 14 14	2 2 2	50 29 29	1 1 1	25 14 14	2 2 2	50 50 50	29 29 29			

\*\*\* Rel - Religious

Table III: 1.2 (cont'd)

Table III: 1.3 Grazing of Livestock

State/ U.T.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total N/S			N/S res- pond- ing	N/S where grazing allowed	4 as % of grazing exists	N/S where grazing exists	6 as % of grazing exists	4 as % of grazing exists	N/S unautho- rised *	9 as % of grazing	9 as % of grazing	N/S with graz- ing fee	12 as % of grazing	12 as % of grazing
A & N	N 6	5	5	0	0	0	0	0						
	S 5	4	4	0	0	0	0	0						
	T 11	9	9	0	0	0	0	0						
AP	S & T 15	14	12	86	12	86	100	0	0	0	0	0	0	0
Aru	N 1	1	1	0	0	0	0	0	0	0	0	0	0	0
	S 4	2	2	100	2	100	100	100	1	50	50	2	100	100
	T 5	3	3	2	2	67	100	100	1	50	33	2	100	100
Bih	S & T 13	6	6	100	6	100	100	1	17	17	17	0	0	0
Goa	N 1	1	1	0	0	1	100	0	1	100	100	0	0	0
	S 3	3	3	0	0	3	100	0	3	100	100	0	0	0
	T 4	4	4	0	0	4	100	0	4	100	100	0	0	0
Gj	N 4	4	4	2	50	4	100	50	2	50	50	1	25	50
	S 12	8	8	5	62	7	88	71	4	57	50	1	14	20
	T 16	12	12	7	58	11	92	64	6	55	50	2	18	29
Har	S & T 1	1	1	0	0	1	100	0	1	100	100	0	0	0
HP	N 1	1	1	1	100	1	100	100	0	0	0	1	100	100
	S 29	13	13	11	85	12	92	92	2	17	15	6	50	55
	T 30	14	14	12	86	13	93	92	2	15	14	7	54	58
J & K	N 3	2	2	2	100	2	100	100	0	0	0	2	100	100
	S 6	3	3	3	100	3	100	100	1	33	33	3	100	100
	T 9	5	5	5	100	5	100	100	1	20	20	5	100	100
Kar	N 3	3	3	0	0	3	100	0	3	100	100	0	0	0
	S 14	11	11	7	64	7	64	100	0	0	0	0	0	0
	T 17	14	14	7	50	10	71	70	3	30	21	0	0	0

\* The same N/S may have both authorised and unauthorised grazing



Table III: 1.3 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- pond- ing	N/S where grazing allowed	4 as % of 3	N/S where grazing exists	6 as % of 3	4 as % of 6	N/S unautho- rised * grazing	9 as % of 6	9 as % of 3	N/S with graz- ing fee	12 as % of 6	12 as % of 4
Ker	N 3 S 11 T 14	3 3 6	0 1 1	0 33 17	1 2 3	33 67 50	0 50 33	1 2 3	100 100 100	33 67 50	0 0 0	0 0 0	0 0 0
Mah	N 4 S 22 T 26	2 7 9	1 4 5	50 57 56	2 5 7	100 71 78	50 80 71	1 1 2	50 20 29	50 14 22	1 3 4	50 60 57	100 75 80
Man	N&T 2	1	0	0	1	100	0	1	100	100	0	0	0
Meg	S&T 2	0											
MP	N 11 S 31 T 42	6 25 31	4 25 29	67 100 94	4 25 29	67 100 94	100 100 100	0 8 8	0 32 28	0 32 26	0 4 4	0 16 14	0 16 14
Nag	S&T 3	0											
Ori	N 1 S 14 T 15	0 6 6	2 2 2	33 33 33	5 5 5	83 83 83	40 40 40	5 5 5	100 100 100	83 83 83	2 2 2	40 40 40	100 100 100
Raj	N 4 S 18 T 22	3 14 17	2 12 14	67 86 82	3 12 15	100 86 88	67 100 93	1 1 2	33 8 13	33 7 12	2 6 8	67 50 53	100 50 57
Sik	N 1 S 3 T 4	1 1 2	1 1 2	100 100 100	1 1 2	100 100 100	100 100 100	0 0 0	0 0 0	0 0 0	1 1 2	100 100 100	100 100 100
TN	N 1 S 10 T 11	1 5 6	0 4 4	0 80 67	0 4 4	0 80 67	0 100 100	0 0 0	0 0 0	0 0 0	4 4 4	100 100 100	100 100 100

Table III: 1.3 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- pond- ing	N/S where grazing allowed	4 as % of 3	N/S where grazing exists	6 as % of 3	4 as % of 6	N/S unauti- cated grazing *	9 as % of 6	9 as % of 3	N/S with graz- ing fee	12 as % of 6	12 as % of 4
UP	N 4	1	1	100	1	100	100	0	0	0	0	0	0
	S 13	8	6	75	6	75	100	2	33	25	3	50	50
	T 17	9	7	78	7	78	100	2	29	22	3	43	43
WB	N 1	1	0	0	0	0	0	0	0	0	0	0	0
	S 13	4	0	0	1	25	0	1	100	25	0	0	0
	T 14	5	0	0	1	20	0	1	100	20			
All India	N 51	36	14	39	24	67	58	10	42	28	8	33	57
	S 242	138	101	73	114	83	89	33	29	24	35	31	35
	T 293	174	115	66	138	79	83	43	31	25	43	31	37

Table III:1.3a Density of Cattle Grazing Inside \* (Extended Database)

N/S	Area (ha)	Total Cattle (1983-84)	Density (Cattle per ha)
MP/S/SAI	1296.54	20000	15.43
MP/S/PAN	245.84	2391	9.73
KAR/S/SHE	39567.00	107000	2.70
MAN/N/KEI	4000.00	10000	2.50
MP/S/KEN	4500.00	9800	2.18
HP/S/REN	407.53	700	1.72
UP/S/KIS	20021.86	27300	1.36
MP/S/BAG	47800.00	60551	1.27
BIH/S/RAJ	3545.00	4500	1.27
GUJ/S/NAL	12082.20	13854	1.15
MP/S/KAR	20221.04	22660	1.12
UP/S/NAW	224.60	250	1.11
AP/S/MAN	2000.00	2000	1.00
BIH/S/LAW	21103.34	20000	0.95
BIH/S/HAZ	18323.00	17300	0.94
KAR/S/MOO	24700.00	21500	0.87
MAH/S/KIN	21876.00	19058	0.87
GUJ/S/JES	18066.29	15000	0.83
RAJ/S/RAM	30700.00	25000	0.81
AP/S/PRA	13602.66	11000	0.81
AP/S/PAK	89205.00	72500	0.81
HP/S/PON	50000.00	40000	0.80
GUJ/S/NAR	30754.53	24063	0.78
AP/S/POC	12963.57	10000	0.77
ORI/S/SAT	79552.00	57000	0.72
KAR/S/BLA	11900.00	8400	0.71
MP/S/KHA	34812.18	24425	0.70
AP/S/SIW	3020.31	2000	0.66
GUJ/S/DUM	15087.21	9500	0.63
MP/S/SEM	43036.12	27000	0.63
HP/S/CHA	10855.00	6451	0.59
HP/S/GAM	900.75	500	0.56
MP/S/BAD	10455.43	5600	0.54
AP/S/ETU	81259.00	42800	0.53
HP/S/TUN	6422.08	3204	0.50
MP/S/NAU	118696.10	57579	0.49
HP/S/TAL	2610.00	1208	0.46
ORI/N/SIM	30300.00	14050	0.46
HAR/S/SUL	117.37	50	0.43
MP/S/PAC	47216.00	20000	0.42
RAJ/S/SHE	9800.00	4130	0.42
MP/S/GOM	27782.00	11500	0.41
BIH/S/TOP	1282.00	490	0.38
RAJ/S/JAI	5200.00	2000	0.38
RAJ/S/JAW	10000.00	3500	0.35
MAH/S/TAN	21675.00	7403	0.34
MP/S/KHE	12270.00	4150	0.34

\* N/S listed in descending order of density, down to a density of 0.01 cattle per ha.

Table III:13a (contd)

N/S	Area (ha)	Total Cattle (1983-84)	Density (Cattle per ha)
HP/S/RUP	12486.97	3967	0.32
BIH/S/PAL	92800.00	30000	0.32
GUJ/S/BAR	18025.13	5500	0.31
MAH/S/DHA	38158.90	11417	0.30
MP/S/BAR	24466.00	6842	0.28
BIH/S/VAL	46160.00	13000	0.28
KAR/S/SHA	43123.00	12000	0.28
BIH/S/GAU	25947.92	7000	0.27
MP/S/GHA	51200.00	13676	0.27
UP/S/CHI	24892.00	6694	0.27
UP/N/DUD	61431.67	16000	0.26
MP/S/PEN	11847.30	3000	0.25
ORI/S/NAN	426.00	105	0.25
KAR/S/SOM	8840.00	2100	0.24
UP/S/KAI	50074.70	11285	0.23
RAJ/S/DAR	26583.00	6000	0.23
MP/S/SING	28791.00	6500	0.23
ARU/S/LAL	19000.00	4218	0.22
HP/S/NAI	4550.00	1000	0.22
UP/S/RAJ	24653.29	5035	0.20
AP/S/KIN	63540.00	12000	0.19
GOA/N/BHA	10700.00	2000	0.19
RAJ/S/BHE	22194.00	4000	0.18
HP/S/KAL	4728.00	853	0.18
MP/S/RAT	66580.00	10948	0.16
RAJ/S/KAI	67638.00	10000	0.15
BIH/S/BHI	68190.17	10000	0.15
MP/S/ACH	55155.21	7800	0.14
MP/S/PHE	11074.00	1500	0.14
MAH/S/GRE	781847.00	108193	0.14
MP/S/PAL	34468.60	4935	0.14
KAR/S/BHA	49246.00	7000	0.14
MAH/S/MEL	159723.00	20653	0.13
GOA/S/BHA	15000.00	2000	0.13
RAJ/N/SAR	27380.00	3677	0.13
MP/S/GAN	22098.60	2866	0.13
MP/S/UDA	24759.00	3250	0.13
GUJ/S/RAT	5565.13	679	0.12
GUJ/N/GIR	141213.15	16947	0.12
GUJ/S/KHI	604.86	75	0.12
GOA/S/BON	800.00	100	0.12
HP/S/DAR	16740.00	1868	0.11
RAJ/S/PHU	51141.00	5400	0.11
RAJ/S/TOD	49528.00	5490	0.11
RAJ/S/KUM	57825.86	5787	0.10
ORI/S/HAD	19160.00	2000	0.10
UP/S/KAT	40009.35	4000	0.10
WB/S/JAL	11562.72	1200	0.10

Table III:1.3a (contd)

N/S	Area (ha)	Total Cattle (1983-84)	Density (cattle per ha)
GOA/S/COT	10500.00	1000	0.10
MP/S/BOR	48277.74	5031	0.10
AP/S/KAW	89228.00	8000	0.09
HP/S/SEC	14865.00	1289	0.09
RAJ/S/SIT	42294.00	3750	0.09
TN/S/POI	1728.76	148	0.09
TN/S/MUD	32100.00	2552	0.08
MP/S/TAM	60852.00	5082	0.08
UP/S/GOV	95312.00	7500	0.08
UP/S/MOT	8851.00	659	0.07
RAJ/S/SAR	49200.00	3677	0.07
RAJ/S/JAM	30000.00	2086	0.07
HP/S/KUG	11828.07	775	0.07
RAJ/S/MOU	28884.00	1738	0.06
HP/S/KAN	6070.00	375	0.06
MP/N/BAN	44884.00	2490	0.06
ORI/S/SIM	244700.00	14050	0.06
MP/N/IND	279908.60	13860	0.05
SIK/S/FAM	1500.00	80	0.05
AP/S/PAP	59068.00	3168	0.05
BIH/S/DAL	19322.00	750	0.04
KER/S/NEY	12800.00	500	0.04
MAH/S/KAR	448.00	20	0.04
KER/S/WYN	34444.09	1500	0.04
MP/S/SAN	364593.00	10473	0.03
TN/S/ANA	95498.00	3060	0.03
KER/N/PER	77700.00	2500	0.03
MP/N/SAT	50244.20	800	0.02
RAJ/N/RAN	39220.00	643	0.02
ORI/S/BHI	65000.00	1000	0.02
KER/S/PER	27100.00	500	0.02
MP/S/SIT	553800.00	8835	0.02
HP/S/SHIK	21350.00	533	0.02
TN/S/MUN	56700.00	1400	0.02
KAR/N/BAN	86573.00	2000	0.02
KAR/N/BANN	10434.82	200	0.02
AP/S/COR	23570.29	150	0.01
GUJ/N/VEL	3408.11	50	0.01
GUJ/S/DHR	484090.00	5000	0.01
HP/S/TIR	17800.00	135	0.01
ARU/S/PAK	86195.00	560	0.01
KER/S/CHIM	7500.00	100	0.01

Table III:1.3b Density of Goats Grazing Inside\* (Extended Database)

N/S	Area (ha)	Total goats (1983-84)	Density (goats per ha)
HP/S/GAM	900.75	4000	4.44
MP/S/SAI	1296.54	5000	3.86
MP/S/PAN	245.84	396	1.61
J&K/S/JAS	912.80	1350	1.48
KAR/S/BLA	11900.00	16000	1.34
MP/S/KEN	4500.00	5180	1.15
J&K/S/SUR	3912.80	3314	0.85
HP/S/TUN	6422.08	5392	0.84
RAJ/N/SAR	27380.00	23016	0.84
RAJ/S/KUM	57825.86	41153	0.71
HP/S/RUP	12486.97	8245	0.66
RAJ/S/KAI	67638.00	40000	0.59
GUJ/S/NAR	30754.53	17558	0.57
BIH/S/LAW	21103.34	12000	0.57
HP/S/REN	407.53	200	0.49
RAJ/S/SAR	49200.00	23016	0.47
ORI/N/SIM	30300.00	14200	0.47
BIH/S/GAU	25947.92	10000	0.39
GUJ/S/DUM	15087.21	5750	0.38
BIH/S/HAZ	18323.00	6600	0.36
AP/S/MAN	2000.00	700	0.35
MP/S/BAG	47800.00	13648	0.29
MAH/S/TAN	21675.00	4500	0.21
HP/S/KUG	11828.07	2431	0.21
ORI/S/NAN	426.00	80	0.19
HP/S/TAL	2610.00	500	0.19
BIH/S/TOF	1282.00	235	0.18
AP/S/POC	12963.57	2000	0.15
MAH/S/GRE	781847.00	107893	0.14
HP/S/KAN	6070.00	867	0.14
ORI/S/SAT	79552.00	9500	0.12
AP/S/ETU	81259.00	8550	0.11
MP/S/BAD	10455.43	1200	0.11
GUJ/S/NAL	12082.20	1356	0.11
RAJ/S/JAI	5200.00	500	0.10
UP/S/GOV	95312.00	10000	0.10
MP/S/CHA	51200.00	5000	0.10
HP/S/TIR	17800.00	1632	0.09
RAJ/S/JAW	10000.00	900	0.09
UP/S/KAI	50074.70	4731	0.09
HP/S/DAR	16740.00	1485	0.09
UP/S/CHI	24892.00	2226	0.09
J&K/S/RAM	1130.00	70	0.06
ORI/S/SIM	244700.00	14200	0.06
RAJ/S/SIT	42294.00	2350	0.06
RAJ/S/PHU	51141.00	2950	0.06

\* N/S listed in descending order of density, down to a density of 0.01 goats per ha.

Table III:1.3b (contd)

N/S	Area (ha)	Total goats (1983-84)	Density (goats per ha)
KAR/S/SHE	39567.00	2500	0.06
HP/S/SHIK	21350.00	1200	0.06
GOA/N/BHA	10700.00	500	0.05
MP/S/GAN	22098.60	1184	0.05
KAR/S/SHA	43123.00	2000	0.05
HP/S/CHA	10855.00	495	0.05
RAJ/S/SHE	9800.00	500	0.05
J&K/N/KIS	40000.00	1577	0.04
HP/S/PON	50000.00	2000	0.04
RAJ/S/DAR	26583.00	1000	0.04
WB/S/JAL	11562.72	500	0.04
HP/S/KAL	4728.00	169	0.04
GOA/S/BHA	15000.00	500	0.03
MP/S/BAR	24466.00	837	0.03
MP/S/PAC	47216.00	1500	0.03
GUJ/N/BAN	2399.44	40	0.02
BIH/S/BHI	68190.17	1200	0.02
UP/S/KAT	40009.35	1000	0.02
MAH/S/KAR	448.00	10	0.02
ORI/S/HAD	19160.00	400	0.02
MP/S/PAL	34468.60	613	0.02
UP/S/KIS	20021.86	250	0.01
MP/S/SAN	364593.00	2346	0.01
MP/S/RAT	66580.00	407	0.01
MP/S/UDA	24759.00	125	0.01
HP/N/GRE	173600.00	2499	0.01
MP/S/NAU	118696.10	1537	0.01
GOA/S/COT	10500.00	75	0.01
MP/S/ACH	55155.21	300	0.01
KAR/S/SOM	8840.00	100	0.01
MP/N/IND	279908.60	2535	0.01
GUJ/S/BAR	18025.13	200	0.01
RAJ/N/RAN	39220.00	494	0.01

Table III:1.3c Density of Sheep Grazing Inside\* (Extended Database)

N/S	Area (ha.)	Total sheep (1983-84)	Density (sheep per ha.)
HP/S/GAM	900.75	5000	5.55
KAR/S/BLA	11900.00	45000	3.78
J&K/S/JAS	912.80	2780	3.05
RAJ/S/KAI	67638.00	110000	1.63
MP/S/SAI	1296.54	2000	1.54
HP/S/TUN	6422.08	8678	1.35
RAJ/S/SHE	9800.00	12000	1.22
RAJ/S/KUM	57825.86	63715	1.10
HP/S/NAI	4550.00	2902	0.64
MP/S/GAN	22098.60	14000	0.63
HP/S/RUP	12486.97	7482	0.60
MP/S/PAN	245.84	125	0.51
J&K/S/SUR	3912.80	1520	0.39
KAR/S/SHE	39567.00	15000	0.38
MAH/N/PEN	47645.40	16800	0.35
HP/S/KUG	11828.07	4178	0.35
RAJ/S/RAM	30700.00	10000	0.33
AP/S/SIW	3020.31	1000	0.33
UP/S/GOV	95312.00	30000	0.31
BIH/S/TOP	1282.00	375	0.29
GUJ/S/NAL	12082.20	3218	0.27
AP/S/MAN	2000.00	500	0.25
HP/S/DAR	16740.00	4228	0.25
MP/S/BAG	47800.00	10124	0.21
HP/S/KAN	6070.00	1180	0.19
TN/S/POI	1728.76	314	0.18
RAJ/N/DES	316200.00	54381	0.17
UP/S/KAI	50074.70	7342	0.15
UP/S/CHI	24892.00	3855	0.15
RAJ/S/BHE	22194.00	3000	0.14
J&K/N/DAC	14100.00	2000	0.14
HP/S/TIR	17800.00	2422	0.14
HP/S/SEC	14865.00	1899	0.13
HP/S/SHIK	21350.00	2800	0.13
HP/S/REN	407.53	50	0.12
AP/S/PRA	13602.66	1600	0.12
UP/S/RAJ	24653.29	2677	0.11
HP/S/TAL	2610.00	300	0.11
MAH/S/GRE	781847.00	76344	0.10
RAJ/S/MOU	28884.00	2520	0.09
AP/S/POC	12963.57	1000	0.08
RAJ/S/DAR	26583.00	2000	0.08
HP/S/PON	50000.00	4000	0.08
ORI/N/SIM	30300.00	2300	0.08
AP/S/PAK	89205.00	6000	0.07

\*N/S listed in descending order of density, down to a density of 0.01 sheep per ha.

Table III:1.3c (contd)

N/S	Area (ha.)	Total sheep (1983-84)	Density (sheep per ha.)
HP/S/CHA	10855.00	688	0.06
HP/S/KAL	4728.00	296	0.06
RAJ/S/SIT	42294.00	2000	0.05
AP/S/ETU	81259.00	4300	0.05
J&K/S/RAM	1130.00	50	0.04
J&K/N/KIS	40000.00	1747	0.04
J&K/N/HEM	60000.00	2250	0.04
RAJ/N/SAR	27380.00	1000	0.04
TN/S/ANA	95498.00	2755	0.03
RAJ/S/PHU	51141.00	1640	0.03
RAJ/S/SAR	49200.00	1000	0.02
MP/S/BAD	10455.43	200	0.02
GUJ/S/NAR	30754.53	732	0.02
UP/S/KIS	20021.86	450	0.02
HP/N/GRE	173600.00	3602	0.02
KAR/N/BAN	86573.00	1500	0.02
AP/S/KAW	89228.00	2000	0.02
GUJ/S/RAT	5565.13	35	0.01
GUJ/S/DHR	484090.00	2500	0.01
MP/S/KEN	4500.00	49	0.01
MP/S/GOM	27782.00	350	0.01
MP/S/GHA	51200.00	600	0.01
ORI/S/SIM	244700.00	2300	0.01
KAR/S/SHA	43123.00	500	0.01
TN/S/MUN	56700.00	700	0.01

Table III:1.3d Density of Feral Cattle Grazing Inside\* (Extended Database)

N/S	Area (ha)	Total feral cattle (1983-84)	Density (feral cattle per ha)
MP/S/PAL	34468.60	8487	0.25
GUJ/N/BAN	2399.44	325	0.14
BIH/S/RAJ	3545.00	500	0.14
GUJ/S/NAR	30754.53	2595	0.08
HP/S/GAM	900.75	30	0.03
KER/N/PER	77700.00	500	0.01
TN/S/POI	1728.76	16	0.01
HP/S/SIM	1925.56	20	0.01
MP/S/BOR	48277.74	320	0.01
MAH/N/SAN	9469.91	100	0.01
HP/S/CHA	10855.00	58	0.01
HP/S/PON	50000.00	500	0.01
GUJ/S/NAL	12082.20	87	0.01

\* N/S listed in descending order of density, down to a density of 0.01 feral cattle per ha.

Table III:1.5 Incidence of Tree Felling and Collection of Minor Forest Products

1	2	Tree felling			Collection of minor forest products (MFP)		
		3	4	5	6	7	8
State/ U.T.	Total N/S	N/S res- ponding	N/S with tree felling incidence	4 as % of 3	N/S res- ponding	N/S having collection of MFP	7 as % of 6
A&N	N	6	5	0	5	0	0
	S	5	5	0	5	0	0
	T	11	10	0	10	0	0
AP	S&T	15	12	6	14	9	64
Aru	N	1	1	0	1	0	0
	S	4	4	1	4	2	50
	T	5	5	1	5	2	40
Bih	S&T	13	9	6	9	7	78
Goa	N	1	1	0	1	1	100
	S	3	3	0	3	1	33
	T	4	4	0	4	2	50
Guj	N	4	4	0	0		
	S	12	10	1	10	6	60
	T	16	14	1	10	6	60
Har	S&T	1	1	0	1	1	100
HP	N	1	1	1	1	1	100
	S	29	24	19	24	19	79
	T	30	25	20	25	20	80
J&K	N	3	2	1	2	1	50
	S	6	2	0	2	1	50
	T	9	4	1	4	2	50
Kar	N	3	2	0	2	0	0
	S	14	14	4	14	6	43
	T	17	16	4	16	6	38
Ker	N	3	3	1	2	1	50
	S	11	8	1	9	3	33
	T	14	11	2	11	4	36
Mah	N	4	3	1	3	2	67
	S	22	9	6	9	6	67
	T	26	12	7	12	8	67
Man	N&T	2	2	0	2	0	0
Meg	S&T	2	2	0	2	0	0

Table III:1.5 (contd)

1		2	3	4	5	6	7	8
		Tree felling			Collection of minor forest products (MFP)			
State/ U.T.		Total N/S	N/S res- ponding	N/S with tree felling incidence	4 as % of 3	N/S res- ponding	N/S having collection of MFP	7 as % of 6
MP	N	11	9	2	22	9	5	56
	S	31	28	19	68	27	22	81
	T	42	37	21	57	36	27	75
Nag								
	S&T	3						
Ori	N	1	1	1	100	1	1	100
	S	14	6	3	50	6	4	67
	T	15	7	4	57	7	5	71
Raj	N	4	4	0	0	4	0	0
	S	18	15	1	7	16	6	38
	T	22	19	1	5	20	6	30
Sik	N	1	0			0		
	S	3	1	1	100	1	0	0
	T	4	1	1	100	1	0	0
TN	N	1	1	0	0	1	0	0
	S	10	8	2	25	8	2	25
	T	11	9	2	22	9	2	22
UP	N	4	4	0	0	4	2	50
	S	13	13	7	54	13	9	69
	T	17	17	7	41	17	11	65
WB	N	1	1	0	0	1	0	0
	S	13	9	1	11	8	0	0
	T	14	10	1	10	9	0	0
All India	N	51	44	7	16	39	14	36
	S	242	183	78	43	185	104	56
	T	293	227	85	37	224	118	53

Table III:1.6 Crop Protection Guns

1	2	3	4	5
State/ U.T.	Total N/S	N/S res- ponding	N/S with CP guns	4 as % of 3
A&N				
N	6	2	0	0
S	5	3	0	0
T	11	5	0	0
AP				
S&T	15	12	10	83
Aru				
N	1	1	1	100
S	4	3	1	33
T	5	4	2	50
Bih				
S&T	13	8	4	50
Goa				
N	1	1	1	100
S	3	3	3	100
T	4	4	4	100
Guj				
N	4	2	2	100
S	12	8	6	75
T	16	10	8	80
Har				
S&T	1	1	0	0
HP				
N	1	0		
S	29	25	25	100
T	30	25	25	100
J&K				
N	3	2	2	100
S	6	4	0	0
T	9	6	2	33
Kar				
N	3	2	1	50
S	14	14	8	57
T	17	16	9	56
Ker				
N	3	2	1	50
S	11	11	8	73
T	14	13	9	69
Mah				
N	4	3	2	67
S	22	9	8	89
T	26	12	10	83
Man				
N&T	2	1	1	100
Meg				
S&T	2	2	2	100
MP				
N	11	11	9	82
S	31	27	20	74
T	42	38	29	76
Nag				
S&T	3	0		

Table III:1.6 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S res- ponding	N/S with CP guns	4 as % of 3
Ori	N	1	1	1	100
	S	14	5	4	80
	T	15	6	5	83
Raj	N	4	3	1	33
	S	18	14	11	78
	T	22	17	12	71
Sik	N	1	1	0	0
	S	3	1	1	100
	T	4	2	1	50
TN	N	1	1	0	0
	S	10	8	4	50
	T	11	9	4	44
UP	N	4	2	2	100
	S	13	12	10	83
	T	17	14	12	86
WB	N	1	1	0	0
	S	13	9	2	22
	T	14	10	2	20
All India	N	51	36	24	67
	S	242	179	127	71
	T	293	215	151	70

Table III:1.7a Use by Other Government Departments

[illegible]

\* Includes fuelwood and minor forest produce collection, and timber felling.

Table III:1.7a (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
State/ U.T	Total N/S	N/S res- ponding	N/S with use	4 as % of 3	Irrigation			Hydel			Fisheries			Roads			Mining			Agriculture			Tourism			Military			Industry			Transmission lines			Housing			Archaeology			Forestry *			Water supply			Railways																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
					No. of N/S	6 as % of 4	6 as % of 3	No. of N/S	9 as % of 4	9 as % of 3	No. of N/S	12 as % of 4	12 as % of 3	No. of N/S	15 as % of 4	15 as % of 3	No. of N/S	18 as % of 4	18 as % of 3	No. of N/S	21 as % of 4	21 as % of 3	No. of N/S	24 as % of 4	24 as % of 3	No. of N/S	27 as % of 4	27 as % of 3	No. of N/S	30 as % of 4	30 as % of 3	No. of N/S	33 as % of 4	33 as % of 3	No. of N/S	36 as % of 4	36 as % of 3	No. of N/S	39 as % of 4	39 as % of 3	No. of N/S	42 as % of 4	42 as % of 3	No. of N/S	45 as % of 4	45 as % of 3	No. of N/S	48 as % of 4	48 as % of 3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Kar	N	3	3	3	100									3	100	100							2	67	67							2	67	67				2	67	67																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	S	14	14	9	64	2	22	14	3	33	21	3	33	21	9	100	64	4	44	29	1	11	7	1	11	7	1	11	7				7	78	50	1	11	7				7	78	50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	T	17	17	12	71	2	17	12	3	25	18	3	25	18	12	100	71	4	33	24	1	8	6	3	25	18	1	8	6				9	75	53	3	25	18				7	58	41																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Ker	N	3	3	1	33			1	100	33				1	100	33							1	100	33				1	100	33	1	100	33				1	100	33																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	S	11	10	6	60	3	50	30	1	17	10			2	33	20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	T	14	13	7	54	3	43	23	2	29	15			3	43	23							1	14	8				1	14	8	2	29	15				2	29	15																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

\*\* Data from Sariska Sanctuary excluded as they were identical to those of Sariska National Park.



Table III: 1.7b Thoroughfare

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having thoroughfare	4 as % of 3
A & N	6	5	0	0
N	5	5	0	0
T	11	10	0	0
AP				
S & T	15	14	9	64
Aru	1	1	1	100
N	4	4	3	75
S	5	5	4	80
T				
Bih				
S & T	13	9	9	100
Goa	1	1	1	100
N	3	3	2	67
S	4	4	3	75
T				
Guj	4	4	2	50
N	12	11	6	55
S	16	15	8	53
T				
Har				
S & T	1	1	0	0
HP	1	1	0	0
N	29	28	13	46
S	30	29	13	45
T				
J & K	3	2	1	50
N	6	4	4	100
S	9	6	5	83
T				
Kar	3	2	2	100
N	14	14	9	64
S	17	16	11	69
T				
Ker	3	3	1	33
N	11	11	5	45
S	14	14	6	43
T				
Mah	4	4	3	75
N	22	11	9	82
S	26	15	12	80
T				
Man				
N & T	2	1	0	0
Meg				
S & T	2	2	0	0
MP	11	11	8	73
N	31	31	23	74
S	42	42	31	74
T				
Nag				
S & T	3	0		

Table III: 1.7(b) (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having thoroughfare	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	3	43
	T	15	8	3	38
Raj	N	4	4	2	50
	S	18	18	12	67
	T	22	22	14	64
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	8	4	50
	T	11	9	4	44
UP	N	4	4	1	25
	S	13	13	5	38
	T	17	17	6	35
WB	N	1	1	0	0
	S	13	9	1	11
	T	14	10	1	10
All India	N	51	47	22	47
	S	242	204	117	57
	T	293	251	139	55

Table III: 1.8 Open to Tourists

1	2	3	4	5
State/ U.T.	Total N/S	N/S responding	N/S open to tourists	4 as % of 3
A&N	N 6	4	3	75
	S 5	2	2	100
	T 11	6	5	83
AP	S&T 15	13	3	23
Aru	N 1	1	1	100
	S 4	2	2	100
	T 5	3	3	100
Bih	S&T 13	9	9	100
Goa	N 1	1	0	0
	S 3	3	1	33
	T 4	4	1	25
Guj	N 4	4	3	75
	S 12	11	9	82
	T 16	15	12	80
Har	S&T 1	1	1	100
HP	N 1	1	1	100
	S 29	23	21	91
	T 30	24	22	92
J&K	N 3	2	2	100
	S 6	4	4	100
	T 9	6	6	100
Kar	N 3	2	2	100
	S 14	14	10	71
	T 17	16	12	75
Ker	N 3	2	2	100
	S 11	8	6	75
	T 14	10	8	80
Mah	N 4	2	2	100
	S 22	10	10	100
	T 26	12	12	100
Man	N&T 2	1	1	100
Meg	S&T 2	2	0	0
MP	N 11	9	9	100
	S 31	22	20	91
	T 42	31	29	93
Nag	S&T 3	0		

Table III: 1.8 (contd)

1		2	3	4	5
<i>State/ U.T.</i>		<i>Total N/S</i>	<i>N/S responding</i>	<i>N/S open to tourists</i>	<i>4 as % of 3</i>
Ori	N	1	1	1	100
	S	14	7	5	71
	T	15	8	6	75
Raj	N	4	4	4	100
	S	18	12	12	100
	T	22	16	16	100
Sik	N	1	1	1	100
	S	3	1	1	100
	T	4	2	2	100
TN	N	1	1	1	100
	S	10	7	7	100
	T	11	8	8	100
UP	N	4	4	3	75
	S	13	8	8	100
	T	17	12	11	92
WB	N	1	1	1	100
	S	13	9	9	100
	T	14	10	10	100
All India	N	51	41	37	90
	S	242	168	140	83
	T	293	209	177	85

Table III:1.8a Tourists (1983-84)

N/S	No of tourists	N/S	No of tourists
AP/S/ETU	2520	MP/N/IND	300
BIH/S/BHI	31000	MP/N/KANH	34520
BIH/S/DAL	685	MP/N/SAT	1000
BIH/S/GAU	1500	MP/S/ACH	750
BIH/S/HAZ	18965	MP/S/BAR	500
BIH/S/LAW	100	MP/S/BOR	36
BIH/S/PAL	24077	MP/S/GHA	1262
BIH/S/RAJ	60000	MP/S/GOM	100
BIH/S/TOP	575	MP/S/KHE	30
BIH/S/VAL	2000	MP/S/NAR	250
CHA/S/SUK	775	MP/S/NAT	5300
COA/S/BON	28000	MP/S/PAC	5600
GUJ/N/BAN	220	MP/S/PEN	300
GUJ/N/GIR	12484	MP/S/RAT	409
GUJ/N/MAR	1500	MP/S/SAI	2000
GUJ/N/VEL	2965	MP/S/SAN	500
GUJ/S/KHI	160	MP/S/SIT	50
GUJ/S/NAL	100000	MP/S/UDA	250
GUJ/S/RAT	515	ORI/N/SIM	7304
HAR/S/SUL	35988	ORI/S/BHI	2000
HP/S/GAM	10	ORI/S/HAD	3000
HP/S/KAL	3626	ORI/S/NAN	610000
HP/S/KAN	1200	ORI/S/SAT	10510
HP/S/KUG	41	ORI/S/SIM	7304
HP/S/TUN	1000	RAJ/N/DES	2507
J&K/N/DAC	744	RAJ/N/KEO	61873
KAR/N/BAND	57865	RAJ/N/SAR	18441
KAR/N/BANN	240000	RAJ/S/JAI	600
KAR/N/NAG	24158	RAJ/S/KUM	108
KAR/S/BHA	1100	RAJ/S/MOU	1500
KAR/S/BLA	4010	RAJ/S/SAR	18441
KAR/S/DAN	1867	RAJ/S/TAL	71
KAR/S/RAN	25000	RAJ/S/VAN	830
KER/N/ERA	95	TN/N/GUI	11300
KER/N/PER	139260	TN/S/ANA	9573
KER/S/NEY	2500	TN/S/KAL	282
KER/S/PEP	2100	TN/S/MUD	27017
KER/S/PER	7856	TN/S/MUN	11601
KER/S/WYN	500	TN/S/NIL	1515
MAH/N/PEN	6524	TN/S/POI	3694
MAH/N/SAN	1510000	TN/S/VED	88626
MAH/S/KAR	20720	UP/N/COR	19621
MAH/S/MEL	5500	UP/N/DUD	5579
MAH/S/NAG	20000	UP/N/VAL	2064
MAH/S/RAD	12981	UP/S/CHI	1527
MAH/S/TAN	2500	UP/S/GOV	401
MAN/N/KEI	3942	UP/S/KAT	500
MAN/N/SIR	3000	WB/S/BAL	20830
MEG/S/NON	400	WB/S/JAL	662
MEG/S/SIJ	216	WB/S/RAM	36500
MP/N/BAN	5314		

Table III: 1.9 Plantation Work

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- ponding	N/S with planta- tion	4 as % of 3	Total area (ha) of planta- tion	Wild- life habita- tion (ha)	7 as % of 6	Fuel (ha)	9 as % of 6	Comm- ercial (ha)	11 as % of 6	Others (ha)	13 as % of 6
A&N	N 6	2	0	0									
	S 5	2	0	0									
	T 11	4	0	0									
AP	S&T 15	13	7	54	3174	67	2	0	0	3107	98	0	0
Aru	N 1	1	1	100	4	4	100	0	0	0	0	0	0
	S 4	4	3	75	120	23	19	0	0	0	0	97	81
	T 5	5	4	80	124	27	22	0	0	0	0	97	78
Bih	S&T 13	9	9	100	4008	107	3	1103	28	2394	60	180	4
Goa	N 1	1	1	100	547	0	0	441	81	102	19	4	1
	S 3	3	3	100	104	2	2	0	0	0	0	34	33
	T 4	4	4	100	651	2	0	441	68	102	16	38	6
Gj	N 4	3	1	33	7813	7813	100	0	0	0	0	0	0
	S 12	10	9	90	5355	103	2	4226	79	76	1	950	18
	T 16	13	10	77	13168	7916	60	4226	32	76	1	950	7
Har	S&T 1	1	1	100	149	149	100	0	0	0	0	0	0
HP	N 1	0											
	S 29	17	9	53	5249	4	0	98	2	4949	94	199	4
	T 30	17	9	53	5249	4	0	98	2	4949	94	199	4
J&K	N 3	2	1	50	25	25	100	0	0	0	0	0	0
	S 6	3	0	0	0	0	0	0	0	0	0	0	0
	T 9	5	1	20	25	25	100	0	0	0	0	0	0

\*Purpose not specified for entire area under plantation

Table III: 1.9 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- ponding	N/S with planta- tion	4 as % of 3	Total area (ha) of planta- tion	Purpose of Plantation by Area*							
						Wild- life habita- tion (ha)	7 as % of 6	Fuel (ha)	9 as % of 6	Comm- ercial (ha)	11 as % of 6	Others (ha)	13 as % of 6
Kar	N 3 S 14 T 17	3 12 15	1 7 8	33 58 53	40 11084 11124	40 180 220	100 2 2	0 6480 6480	0 58 58	0 4326 4326	0 39 39	0 30 30	0 0 0
Ker	N 3 S 11 T 14	3 8 11	1 3 4	33 38 36	338 2219 2557	228 0 228	67 0 9	58 545 603	17 25 24	0 1545 1545	0 70 60	52 129 181	15 6 7
Mah	N 4 S 22 T 26	3 9 12	3 5 8	100 56 67	235 2496 2731	10 2491 2501	4 100 92	0 0 0	0 0 0	60 0 60	26 0 2	0 3 3	0 0 0
Man	N&T 2	1	1	100	226	226	100	0	0	0	0	0	0
Meg	S&T 2	2	1	50	10	10	100	0	0	0	0	0	0
MP	N 11 S 31 T 42	9 25 34	3 10 13	33 40 38	360 1995 2355	100 135 235	28 7 10	0 420 420	0 21 18	60 370 430	17 19 18	200 1071 1271	56 54 54
Nag	S&T 3	1	1	100	150	150	100	0	0	0	0	0	0
Orh	N 1 S 14 T 15	0 5 5	4 4 4	80 80 80	1811 1811 1811	1284 1284 1284	71 71 71	0 0 0	0 0 0	527 527 527	29 29 29	0 0 0	0 0 0
Raj	N 4 S 18 T 22	4 17 21	1 11 12	25 65 57	22 4953 4975	22 2418 2440	100 49 49	0 2326 2326	0 47 47	0 0 0	0 0 0	0 0 0	0 0 0

Table III: 1.9 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- ponding	N/S with plan- ta- tion	4 as % of 3	Total area (ha) of plan- ta- tion	Wild- life habi- tat (ha)	7 as % of 6	Fuel (ha)	9 as % of 6	Comm- ercial (ha)	11 as % of 6	Others (ha)	13 as % of 6
Purpose of Plantation by Area*													
Sik	N 1	1	1	100	40	40	100	0	0	0	0	0	0
S	3	1	0	0	0	0	0	0	0	0	0	0	0
T	4	2	1	50	40	40	100	0	0	0	0	0	0
TN	N 1	1	0	0	0	0	0	0	0	0	0	0	0
S	10	6	2	33	1011	94	9	95	9	242	24	0	0
T	11	7	2	29	1011	94	9	95	9	242	24	0	0
UP	N 4	4	2	50	175	82	47	0	0	0	0	94	54
S	13	9	6	67	3063	32	1	364	12	1498	49	633	21
T	17	13	8	62	3238	114	4	364	11	1498	46	727	22
WB	N 1	1	0	0	0	0	0	0	0	0	0	0	0
S	13	8	3	38	65	50	77	0	0	0	0	0	0
T	14	9	3	33	65	50	77	0	0	0	0	0	0
All India	N 51	39	17	44	9825	8590	87	499	5	222	2	350	4
S	242	163	94	57	47016	7299	16	15657	33	19034	40	3326	7
T	293	204	111	54	56841	15889	28	16156	28	19256	34	3676	6

Table III: 1.10 Vulnerable Areas

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having vulnerable areas	4 as % of 3
A & N N	6	5	0	0
S	5	5	0	0
T	11	10	0	0
AP				
S & T	15	14	3	21
Aru N	1	1	1	100
S	4	5	3	60
T	5	6	4	67
Bih				
S & T	13	9	2	22
Goa N	1	1	0	0
S	3	3	0	0
T	4	4	0	0
Guj N	4	4	0	0
S	12	11	3	27
T	16	15	3	20
Har				
S & T	1	1	0	0
HP N	1	1	0	0
S	29	28	3	11
T	30	29	3	10
J & K N	3	2	0	0
S	6	3	0	0
T	9	5	0	0
Kar N	3	3	1	33
S	14	14	2	14
T	17	17	3	18
Ker N	3	2	1	50
S	11	11	7	64
T	14	13	8	62
Mah N	4	4	1	25
S	22	11	2	18
T	26	15	3	20
Man				
N & T	2	1	0	0
Meg				
S & T	2	2	0	0
MP N	11	11	3	27
S	31	31	10	32
T	42	42	13	31
Nag				
N & T	3	0		

Table III: 1.10 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having vulnerable areas	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	2	29
	T	15	8	2	25
Raj	N	4	4	1	25
	S	18	18	4	22
	T	22	22	5	23
Sik	N	1	1	1	100
	S	3	1	0	0
	T	4	2	1	50
TN	N	1	1	0	0
	S	10	7	2	29
	T	11	8	2	25
UP	N	4	4	1	25
	S	13	12	5	42
	T	17	16	6	38
WB	N	1	1	1	100
	S	13	9	0	0
	T	14	10	1	10
All India	N	51	47	11	23
	S	242	202	48	24
	T	293	249	59	24

Table III: 2.1 Illegal Use/Occupation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39			
State/ U.T.	Total N/S	N/S respond- ing	N/S with illegal use/ occupation	4 as % of 3	Activity															By whom										Action taken											
					Gu	L	P	M	La	Mf	G	F	B	E	Po	Tm	V	Le	Pp	Go	Gu	ST	N	As	H	Mw	T	A	Ca	Ea	I	Te	Wc	Ev	Bp	R	Hm	Mc			
A & N	N	6	2	0	0																																				
	S	5	4	0	0																																				
	T	11	6	0	0																																				
AP	S & T	15	14	3	21	3	2	1									2	2	2								4														
Aru	N	1	1	0	0																																				
	S	4	4	1	25	1			1	1	1									2		2						4													
	T	5	5	1	20	1			1	1	1									2		2						4													
Bih	S & T	13	7	1	14	1											1											1													
Goa	N	1	1	0	0																																				
	S	3	3	1	33	*																																			
	T	4	4	1	25																																				
Guj	N	4	2	0	0																																				
	S	12	5	1	20						1	1	1				3																								
	T	16	7	1	14						1	1	1				3																								
Har	S & T	1	1	0	0																																				
HP	N	1	1	0	0																																				
	S	29	28	3	11	1					1				1		1																								
	T	30	29	3	10	1					1				1		1																								
J & K	N	3	2	0	0																																				
	S	6	2	2	100							2					2							2																	
	T	9	4	2	50							2					2							2																	
Kar	N	3	2	0	0																																				
	S	14	13	7	54	5						2			1		4																								
	T	17	15	7	47	5						2			1		4																								

\* No further details available for sanctuaries in Goa

Table III: 2.1 (contd)

Table III: 2.1 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
State/ U.T.	Total N/S	N/S respond- ing	N/S with illegal use/ occupation	4 as % of 3	Activity														By whom								Action taken											
					Gu	L	P	M	La	Mf	G	F	B	E	Po	Tm	V	Le	Pp	Go	Gu	ST	N	As	H	Mw	T	A	Ca	Ea	I	Te	Wc	Ev	Bp	R	Hm	Mc
UP	N	4	4	1	25																																	
	S	13	12	1	8	1											1	1																				
	T	17	16	2	13	1												1	1																			
WB	N	1	1	0	0												1	2																				
	S	13	9	0	0																																	
	T	14	10	0	0																																1	
All India	N	51	36	3	8	1	0	0	0	0	1	0	0	0	0	1	2	0																				
	S	242	176	46	26	21	2	1	1	1	11	3	1	12	2	0	29	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	
	T	293	212	49	23	22	2	1	1	1	12	3	1	12	2	1	31	3	7	2	2	8	2	4	1	1	4	4	15	3	2	1	2	8	2	1	1	0
				%	37	3	2	2	2	2	20	5	2	20	3	2	62	5	7	2	1	8	2	4	1	1	4	4	15	3	2	1	2	10	2	1	1	1
Codes																		12	3	2	13	3	7	2	2	9	9	33	7	4	2	4	22	4	2	2	2	

## Activity

## By Whom

## Action Taken

Gu	- Cultivation	V	- Villagers	T	- Territorial staff acting or asked to act
L	- Labour camps	Le	- Lessees	A	- Action to exclude the areas initiated
P	- Pisciculture	Pp	- Private people	Ca	- Case instituted
M	- Microhydel scheme	Go	- Government	Ea	- Earmarking areas for the activities
La	- Artificial Lake	Gu	- Gujars	I	- Cattle confined to cattle farms
MF	- Mithun farm	ST	- Scheduled Tribes	Te	- Digging trenches
G	- Grazing	N	- Nomadic tribes	Wc	- Providing watchers
F	- Fishing	As	- Agriculturists from sanctuary	Ev	- Eviction
B	- Boating	H	- Hillmen	Bp	- Being processed
E	- Encroachment	Mw	- Mine workers	R	- Reported to Government
Po	- Poaching			Hm	- High-level meetings held
Tm	- Temple			Mc	- Matter under consideration

Table III:2.2 Parks/Sanctuaries with Encroachment, and Action Taken  
(Extended Database)

N/S	Action taken
A&N/N/MAR	MATTER REPORTED TO ADMINISTRATION FOR SHIFTING OUTSIDE
AP/S/ETU	NOT KNOWN (DEALT WITH BY TERRITORIAL STAFF)
ARU/S/ITA	NOT KNOWN
ARU/S/MEH	REDIFINING BOUNDARY TO EXCLUDE SUCH AREAS IN EXCHANGE FOR EQUAL AREA IN N-E CORNER OF SANCTUARY
ARU/S/PAK	PRESENT PRIOR TO FORMATION OF SANCTUARY; NO ACTION
BIH/S/BHI	CASES FILED IN COURT
BIH/S/HAZ	CASES INSTITUTED AGAINST ALL
GUJ/S/KHI	CASE HAS BEEN FILED IN COURT AGAINST KHIJADIYA SALT WORKS
HP/S/TAL	CASE FILED
KAR/S/DAN	NONE
KAR/S/SHE	NONE DUE TO INADEQUATE STAFF
KAR/S/SOM	NONE DUE TO ABSENCE OF STAFF
KER/S/IDU	ENCROACHERS TO BE REHABILITATED
KER/S/PER	EVICTED IN MAY 1984
MAH/N/SAN	PROPOSAL SENT TO GOVT OF MAHARASHTRA FOR REGULARISATION, AND REMOVAL OF NEW ENCROACHMENT
MAN/N/KEI	EVICION BEING ATTEMPTED, MATTER BEING PROCESSED
MEG/S/NON	TAKEN UP WITH DY. COMMISSIONER
MP/S/BAG	PROVISIONAL OFFENCE REPORTS ISSUED, PENALISED, REMOVED FROM PATCH (ENCROACHMENTS EXISTED PRIOR TO TRANSFER TO FOREST DEPARTMENT IN 1982-83)
MP/S/BOR	NONE
MP/S/NAR	PRESENT PRIOR TO FORMATION; NO ACTION
MP/S/PAN	BEING PROCESSED
MP/S/SEM	CASE REGISTERED
MP/S/SIN	SOME PROSECUTED, SOME EVACUATED, SOME TO BE PROSECUTED
MP/S/SIT	COURT CASES FILED
ORI/S/BHI	OF 2354 HA ENCROACHED, 2160 HA. REGULARISED BY GOVT; REST 194 HA UNDER ILLEGAL OCCUPATION
RAJ/S/JAI	CASES FILED
RAJ/S/KAI	UNDER COURT TRIAL
RAJ/S/KUM	CHALLANED IN COURT
RAJ/S/MOU	CASES REGISTERED
RAJ/S/PHU	EVICION CASES FILED IN COURT UNDER FOREST AND LAND REVENUE ACTS
RAJ/S/SIT	CHALLANED IN COURT
RAJ/S/VAN	CHALLANED UNDER SEC 91 OF RAJASTHAN LAND REVENUE ACT OF 1956
TN/S/ANA	NO ACTION TAKEN (ENCROACHERS ARE POOR HILL TRIBALS AND HARIJANS)
TN/S/MUN	EVICION NOTICES HAVE BEEN SERVED
UP/S/KAI	NOT KNOWN (ACTION TAKEN BY TERRITORIAL FOREST DIVISIONS)

Table III: 2.3a Recorded Offences

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
State/ U.T.	Total N/S	N/S res- ponding	N/S re- porting cases	4 as % of 3	Total number of cases specifying type of offence									
					IE	IC	IH	FH	IW	IU	DH	IG	NR	OT
A & N N	6	5	0	0										
S	5	5	1	20			1							
T	11	10	1	10			1							
AP														
S & T	15	13	7	54			27		1		22	4		
And														
N	1	1	1	100		1					1			
S	4	4	3	75		1	4				65	39		
T	5	5	4	80		2	4				66	39		
Bih														
S & T	13	7	6	86			45	2			109	10		
Goa														
N	1	1	1	100			6		1		1			
S	3	3	**1	33										
T	4	4	2	50			6		1		1			
Guj														
N	4	4	4	100		28	5	30	204		2694	1375		457
S	12	10	6	60			74	13			2	641		
T	16	14	10	71		28	5	104	217		2696	2016		457
Har														
S & T	1	1	0	0										
HP														
N	1	1	0	0										
S	29	21	8	38				2						
T	30	22	8	36				2						
J & K														
N	3	2	2	100			1				340			
S	6	4	4	100		8	1			13	42	16		
T	9	6	6	100		8	2			13	382	16		
Kar														
N	3	3	3	100			34				696	54		
S	14	14	8	57		3	17		1		722	2		
T	17	17	11	65		3	51		1		1418	56		

\*\* Data for Bhagwan Mahavir National Park includes data for Bhagwan Mahavir Sanctuary

# Incidence mentioned but numbers not given

Table III: 2.3a (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
State/ U.T.	Total N/S	N/S res- ponding	N/S re- porting cases	4 as % of 3	Total number of cases specifying type of offence									
					IE	IC	IH	FH	IW	IU	DH	IG	NR	OT
Ker	N 3	2	1	50	2		21		1	48	163			
	S 11	9	3	33			15		#		187			
	T 14	11	4	36	2		36		1	48	350			
Mah	N 4	4	4	100			19	173	1		74	25		
	S 22	8	5	63	8		40	216	1		2	1414		
	T 26	12	9	75	8		59	389	2		76	1439		
Man	N & T 2	1	1	100	7	2	2				10			
Meg	S & T 2	2	1	50	1							1		
MP	N 11	10	5	50	85		135	31	25	1	940	721		
	S 31	24	16	67	25	8	180	27	4		2771	739		
	T 42	34	21	62	110	8	315	58	29	1	3711	1460		
Nag	S & T 3	0												
Ori	N 1	0												
	S 14	6	5	83	2257	27	87	1	2		592			
	T 15	6	5	83	2257	27	87	1	2		592			
Raj	N 4	4	4	100			243	7			13180	3267		
	S 18	14	9	64		5	79				*1504	2304	#	
	T 22	18	13	72		5	322	7			14684	5571		
Sik	N 1	1	1	100			3							
	S 3	1	0	0										
	T 4	2	1	50			3							
TN	N 1	1	1	100	22		13		5		212	13		
	S 10	7	5	71	323	18	63	4	4		1802	118		
	T 11	8	6	75	345	18	76	4	9		2014	131		

\* Numbers not available for all sanctuaries reporting cases

# Incidence mentioned but numbers not given

Table III: 2.3a (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
State/ U.T.	Total N/S	N/S res- ponding	N/S re- porting cases	4 as % of 3	Total number of cases specifying type of offence									
					IE	IC	IH	FH	IW	IU	DH	IG	NR	OT
UP	N 4	4	2	50	40		203	5	1	8	341	73	1	
	S 13	10	5	50	6	1	175		1		5	4		
	T 17	14	7	50	46	1	378	5	2	8	346	77	1	
WB	N 1	1	1	100	34		12				767			
	S 13	9	3	33	31		10		12	1	9591	91		
	T 14	10	4	40	65		22		12	1	10358	91		
All	N 51	45	31	69	219	7	722	420	34	57	19419	5528	1	457
India	S 242	172	96	56	2652	70	818	265	26	14	17416	5383	0	0
	T 293	217	127	59	2871	77	1540	685	60	71	36835	10911	1	457

IE - Improper entry; IC - Improper conduct; IH - Illegal hunting; FH - Fire hazard; IW - Illegal weapons; IU - Illegal use of explosives;  
 DH - Destruction of habitat; IG - Illegal grazing; NR - Non-registration of arms; OT - Others.

Table III:2.3b Details of Offences

1	2	3	4	5	6	7	8	9
Category of offence (section of Wildlife Act)	N/S with incidents	% of N/S responding*	Total no. of cases	N/S giving details	Avg. no of cases per N/S giving details	Avg. no of cases per N/S responding	4 as % of total no. of cases 53331	Range
Improper Entry (27:1)	N 11 S 14 T 25	24 8 12	219 2652 2871	11 12 23	20 221 125	5 15 13	0.41 5 5	1-81 1-2241 1-2241
Improper Conduct (27:2)	N 2 S 13 T 15	4 8 7	7 70 77	2 13 15	4 5 5	0.15 0.41 0.35	0.01 0.13 0.14	1-5 1-18 1-18
Illegal Hunting (29:1)	N 26 S 75 T 101	54 44 46	722 641 1363	26 72 98	28 9 14	15 4 6	1 1 3	1-186 1-82 1-186
Causing Fire Hazards (30)	N 11 S 12 T 23	23 7 11	420 265 685	11 12 23	38 22 30	7 2 3	0.79 0.50 1	1-196 1-174 1-196
Illegal Weapons (31)	N 7 S 15 T 22	15 9 10	34 26 60	7 13 20	5 2 3	0.71 0.15 0.28	0.06 0.05 0.11	1-24 1-12 0-24
Illegal use of Explosives etc.	N 3 S 2 T 5	7 1 2	57 14 71	3 2 5	19 7 14	1 0.08 0.33	0.11 0.03 0.13	1-48 1-13 1-48
Destruction of Habitat (35:6)	N 20 S 39 T 59	44 23 27	19419 17416 36835	20 37 57	971 471 646	432 101 170	36 33 69	1-11138 1-2391 1-11138
Illegal Grazing/Entry of cattle (35:7)	N 15 S 35 T 50	33 20 23	5528 5383 10911	15 34 49	369 158 223	123 31 50	10 10 20	1-1611 1-2239 1-2239
Non-registration of Arms (34:1)	N 1 S 2 T 3	2 1 1	1 0 1	1 0 1	1 0 1	0.02 0 0.005	0.002 0 0.002	1 0 1
Others	N 1 S 0 T 1	2 0 0.46	457 0 457	1 0 1	457 0 457	10 0 2	0.86 0 0.86	457 0 457
All Offences	N S T		26864 26467 53331					

\* N Responding-45; S Responding-172; T Responding-217

Table III:3.1 Incidence of Injury or Death to Humans by Wildlife

1	2	3	4	5	6	7	8	9	10	11
State/ U.T.	Total N/S	N/S res- pond- ing	N/S having in- cidence	4 as % of 3	Total cases	Total fatal cases	7 as % of 6	Range of Com- pensation paid (Rs.)		Species involv- ed #
								Fatal cases	Others	
A & N	N	6	5	0	0	0	0			
	S	5	5	0	0	0	0			
	T	11	10	0	0	0	0			
AP	S & T	15	13	2	15	4	0	0	0	Bear-2 Tiger-2
Aru	N	1	1	0	0	0	0			
	S	4	2	1	50	1	1	100	0	0
	T	5	3	1	33	1	1	100	0	0
Bih	S & T	13	9	6	67	#42	#31	74	5000- 10000	Cost of medi- cine Bear-1, Leo- pard-1 Wolf-11
Goa	N	1	1	0	0	0	0	0		
	S	3	3	1	33	1	1	100	10000	Bison-1
	T	4	4	1	25	1	1	100	10000	
Guj	N	4	3	1	33	25	9	36	1000	Med. exp.
	S	12	7	0	0	0	0	0		Lion-11, Leo- pard-14
	T	16	10	1	10	25	9	36	1000	
Har	S & T	1	1	0	0	0	0	0		
HP	N	1	0							
	S	29	18	2	11	2	1	50	0	0
	T	30	18	2	11	2	1	50	0	0
J & K	N	3	0							
	S	6	1	0	0	0	0	0		
	T	9	1	0	0	0	0	0		
Kar	N	3	3	3	100	11	9	82	2000- 10000	500 Ele- phant-2
	S	14	11	3	27	4	4	100	2000	Ele- phant-3, Gaur-1
	T	17	14	6	43	15	13	87	2000- 10000	500

# Data not given for all cases

Table III:3.1 (contd)

1	2	3	4	5	6	7	8	9	10	11
State/ U.T.	Total N/S	N/S res- pond- ing	N/S having in- cidence	4 as % of 3	Total cases	Total fatal cases	7 as % of 6	Range of Com- pensation paid (Rs.)		Species involv- ed #
								Fatal cases	Others	
Ker	N	3	3	1	33	1	1	100	0	0 Ele- phant-1,
	S	11	9	3	33	16	6	38	5000	300 Ele- phant-9, Croco- dile-7
	T	14	12	4	33	17	7	41	5000	300
Mah	N	4	4	0	0	0	0	0		
	S	22	10	0	0	0	0	0		
	T	26	14	0	0	0	0	0		
Man										
N & T	2	1	1	100	1	1	100	0	0	Bear-1
Meg										
S & T	2	2	1	50	13	11	85	6000	0	Ele- phant-10, Gaur-2, Tiger-1
MP	N	11	7	4	57	25	4	16	5000- 10000	500 Bear-5, Tiger-15 Nilgai-1
	S	31	27	16	59	97	39	40	200- 5000	200 Bear-57, Boar-3, Buffalo-2 Leo- pard-3, Ele- phant-1, Tiger-5, Hyena-1
	T	42	34	20	59	122	43	35	200- 10000	200- 500
Nag										
S & T	3	1	0	0	0	0	0	0		
Ori	N	1	0							
	S	14	5	3	60	17	16	94	300- 2000	Medi- cal treat- ment Cro- codile-5, Tiger-6, Ele- phant-6
	T	15	5	3	60	17	16	94		

Table III:3.1 (contd)

1	2	3	4	5	6	7	8	9	10	11
State/ U.T.	Total N/S	N/S res- pond- ing	N/S having in- cidence	4 as % of 3	Total cases	Total fatal cases	7 as % of 6	Range of Com- pensation paid (Rs.)		Species involv- ed #
								Fatal cases	Others	
Raj	N	4	4	1	25	1	1	100	0	0
	S	18	16	2	13	5	1	20	0	0
	T	22	20	3	15	6	2	33	0	0
Sik	N	1	1	0	0	0	0	0		
	S	3	1	0	0	0	0	0		
	T	4	2	0	0	0	0	0		
TN	N	1	1	0	0	0	0	0		
	S	10	7	3	43	13	11	85	0-1000	0
	T	11	8	3	38	13	11	85		0
UP	N	4	4	2	50	123	120	98	5000	1000
	S	13	11	5	45	34	34	100	2500- 5000	0
	T	17	15	7	47	154	98	2500- 5000	0-1000 5000	0
WB	N	1	1	1	100	192	184	96	*1500	0
	S	13	8	1	13	1	0	0		400
	T	14	9	2	22	193	184	95	*1500	0-400
All India	N	51	39	14	36	379	329	87	0-10000	0-1000
	S	242	167	49	29	250	156	62	0-10000	0-400
	T	293	206	63	31	629	485	77	0-10000	0-1000

\* Paid only for attacks by tigers

Table III:3.2 Clashes with Local Populace

1	2	3	4	5	6	7	8
State/ U.T.	Total N/S	N/S res- pond-	N/S with clashes	4 as % of 3	Total No. of clashes	Range Across N/S	Reasons for the clashes
A & N	N	6	5	0	0		
	S	5	4	0	0		
	T	11	9	0	0		
AP	S & T	15	11	0	0		
Aru	N	1	1	1	100	1	Boundary dispute
	S	4	3	0	0		
	T	5	4	1	25	1	
Bih	S & T	13	9	2	22	4	Tribal hunt, Death by wild elephant
Goa	N	1	1	0	0		
	S	3	3	0	0		
	T	4	4	0	0		
Guj	N	4	3	1	33	12	Illicit felling, poaching
	S	12	10	2	20	13	Illicit felling, poaching
	T	16	13	3	23	25	
Har	S & T	1	1	0	0		
HP	N	1	1	1	100	1	Killing of deer
	S	29	22	2	9	2	Killing of wild animals
	T	30	23	3	13	3	
J & K	N	3	1	1	100	1	Poaching
	S	6	2	1	50	2	Illegal grazing
	T	9	3	2	67	3	
Kar	N	3	3	0	0		
	S	14	14	0	0		
	T	17	17	0	0		
Ker	N	3	3	1	33	2	Poaching
	S	11	11	1	9	1	Forest offences
	T	14	14	2	14	3	
Mah	N	4	4	2	50	5	Illegal felling, Dispute over supply of bamboos, Misbehaviour by visitors, Encroachment
	S	22	10	2	20	2	Illegal felling, Encroachment
	T	26	14	4	29	7	
Man	N & T	2	1	1	100	1	Cutting reeds
Meg	S & T	2	2	0	0		

Table III:3.2 (contd)

1	2	3	4	5	6	7	8
State/ U.T.	Total N/S	N/S res- pond-	N/S with clashes	4 as % of 3	Total No. of clashes	Range Across N/S	Reasons for the clashes
MP	N	11	9	3	33	20	1-18
	S	31	26	9	35	23	1-10
	T	42	35	12	34	43	1-18
Nag	S & T	3	1	0	0		
Ori	N	1	0				
	S	14	6	2	33	3	1-2
	T	15	6	2	33	3	1-2
Raj	N	4	4	3	75	6	1-3
	S	18	16	6	38	7	1-2
	T	22	20	9	45	13	1-3
Sik	N	1	1	0	0		
	S	3	1	0	0		
	T	4	2	0	0		
TN	N	1	1	0	0		
	S	10	6	1	17	1	1
	T	11	7	1	14	1	1
UP	N	4	4	1	25	1	1
	S	13	12	1	8	1	1
	T	17	16	2	13	2	1
WB	N	1	1	1	100	1	1
	S	13	9	2	22	21	1-20
	T	14	10	3	30	22	1-20
All India	N	51	43	16	37	51	1-18
	S	242	179	31	17	80	1-20
	T	293	222	47	21	131	1-20

Table IV: 1.1 N/S with Management Plans (Extended Database)

N/S	Management Plans		N/S	Management Plans	
	Approval	Date of Approval		Approval	Date of Approval
ARU/N/NAM			MP/N/BAN	Y	24/09/75
ARU/S/LAL			MP/N/IND		
BIH/S/BHI	N		MP/N/KAN	Y	26/09/74
BIH/S/DAL			MP/N/PEN		
BIH/S/GAU	N		MP/S/ACH		
BIH/S/HAZ	N		MP/S/BAD		
BIH/S/PAL			MP/S/BAG	Y	01/01/79
BIH/S/RAJ			MP/S/BAR		
BIH/S/VAL			MP/S/BOR	Y	10/10/77
CHA/S/SUK	Y	01/01/86	MP/S/NAR		
GUJ/N/BAN	N		MP/S/PAC		
GUJ/S/BAR	N		MP/S/PEN	N	
GUJ/S/DHR			MP/S/RAT	Y	23/08/79
HAR/S/SUL	Y	01/01/81	MP/S/SAN		
HP/S/KAN			MP/S/SEM		
HP/S/PON	Y	01/12/84	MP/S/SIN		
HP/S/SHIK	N		MP/S/SIT	Y	23/02/77
HP/S/SIM			MP/S/SON		
HP/S/TIR			MP/S/TAM		
J & K /N/DAC			NAG/S/INT	Y	01/01/84
J & K /N/HEM			ORI/N/SIM		
J & K/N/KIS	N		ORI/S/BHI		
J & K/S/JAS			ORI/S/CHA		
J & K/S/NAN	N		ORI/S/HAD		
J & K/S/OVE			ORI/S/NAN		
J & K/S/RAM			ORI/S/SAT		
KAR/N/BAND			ORI/S/SIM		
KAR/N/BANN			RAJ/N/RAN		
KAR/N/NAG			RAJ/N/SAR	Y	01/01/79
KER/N/PER			RAJ/S/NAH		
KER/S/NEY	Y	01/01/80	RAJ/S/SAR	Y	01/01/78
MAH/N/NAW			SIK/N/KHA		
MAH/N/PEN			TN/N/GUI		
MAH/N/SAN	Y	29/09/83	TN/S/KAL		
MAH/N/TAD	N		TN/S/MUD		
MAH/S/BOR	N		TN/S/MUN		
MAH/S/DEU	Y	05/05/78	TN/S/POI		
MAH/S/DHA	Y	24/01/74	UP/N/COR		
MAH/S/GRE	Y	18/03/81	UP/N/DUD		
MAH/S/KAL	Y	25/02/86	UP/S/KAI		
MAH/S/MEL	Y	24/01/74	UP/S/KED		
MAH/S/NAG	N		WB/N/SUN		
MAH/S/NAN	N		WB/S/BAL	Y	17/02/83
MAN/N/SIR	Y	07/07/86	WB/S/JAL	N	
MEG/S/NON	Y	01/07/82	WB/S/RAM	N	
MEG/S/SIJ	Y	01/01/83			

**Consolidated figures**

Total N/S with plans: 91 (26 national parks and 65 sanctuaries)

N/S with approved plans: 23

N/S with plans not approved: 15

N/S not responding to question on plan approval: 53

Table IV:1.2 Separate Budget (Extended Database)

<i>N/S</i>	<i>Existence of separate budget</i>	<i>N/S</i>	<i>Existence of separate budget</i>
A&N/N/MAR	N	GUJ/S/HIN	N
A&N/N/MID	N	GUJ/S/JES	Y
A&N/N/MOU	N	GUJ/S/KHI	Y
A&N/N/NOR	N	GUJ/S/NAL	Y
A&N/N/SAD	N	GUJ/S/NAR	Y
A&N/N/SOU	N	GUJ/S/RAT	Y
A&N/S/BAT	N	HAR/S/SUL	Y
A&N/S/CHO	N	HP/N/GRE	N
A&N/S/INT	N	HP/N/PIN	Y
A&N/S/MEG	N	HP/S/BAN	N
A&N/S/NAR	N	HP/S/CHA	N
A&N/S/NOR	N	HP/S/DARA	N
A&N/S/SOU	N	HP/S/DARL	N
A&N/S/TIL	N	HP/S/GAM	N
AP/S/COR	N	HP/S/GOB	N
AP/S/ETU	Y	HP/S/KAI	N
AP/S/KAW	Y	HP/S/KAL	N
AP/S/KIN	Y	HP/S/KAN	N
AP/S/KOL	N	HP/S/KHO	N
AP/S/MAN	Y	HP/S/KUG	N
AP/S/NAG	Y	HP/S/LIP	N
AP/S/NEL	Y	HP/S/MAJ	N
AP/S/PAK	Y	HP/S/MAN	N
AP/S/PAP	N	HP/S/NAI	N
AP/S/POC	Y	HP/S/NAR	N
AP/S/PRA	Y	HP/S/PON	N
AP/S/PUL	Y	HP/S/RAK	N
AP/S/SIW	Y	HP/S/REN	N
ARU/N/NAM	Y	HP/S/RUP	N
ARU/S/ITA	Y	HP/S/SEC	N
ARU/S/LAL	Y	HP/S/SHIK	N
ARU/S/LAL	Y	HP/S/SHIL	N
ARU/S/MEH	Y	HP/S/SHIM	N
BIH/S/BHI	Y	HP/S/TAL	N
BIH/S/DAL	Y	HP/S/TIR	N
BIH/S/GAU	Y	HP/S/TUN	N
BIH/S/HAZ	Y	J&K/N/DAC	N
BIH/S/LAW	Y	J&K/N/HEM	Y
BIH/S/PAL	Y	J&K/N/KIS	Y
BIH/S/RAJ	Y	J&K/S/JAS	Y
BIH/S/TOF	N	J&K/S/LUN	N
BIH/S/VAL	Y	J&K/S/NAN	Y
CHA/S/SUK	Y	J&K/S/OVE	Y
GOA/N/BHA	N	J&K/S/RAM	N
GOA/S/BHA	N	KAR/N/BAND	Y
GOA/S/BON	N	KAR/N/BANN	Y
GOA/S/COT	N	KAR/N/NAG	Y
GUJ/N/BAN	Y	KAR/S/ADI	N
GUJ/N/GIR	Y	KAR/S/BHA	Y
GUJ/N/MAR	Y	KAR/S/BIL	N
GUJ/N/VEL	Y	KAR/S/BLA	Y
GUJ/S/BAR	Y	KAR/S/BRA	N
GUJ/S/DHR	Y		
GUJ/S/DUM	Y		

Table IV:1.2 *contd)*

N/S	Existence of separate budget	N/S	Existence of separate budget
KAR/S/DAN	Y	MP/N/VAN	Y
KAR/S/GHA	N	MP/S/ACH	N
KAR/S/MEL	N	MP/S/BAD	Y
KAR/S/MOO	Y	MP/S/BAG	Y
KAR/S/NUG	N	MP/S/BAR	Y
KAR/S/RAN	N	MP/S/BHA	Y
KAR/S/SHA	Y	MP/S/BOR	Y
KAR/S/SHE	Y	MP/S/GAN	Y
KAR/S/SOM	Y	MP/S/GHA	Y
KER/N/ERA	Y	MP/S/GOM	Y
KER/N/PER	Y	MP/S/KAR	Y
KER/N/SIL	N	MP/S/KEN	Y
KER/S/ARA	N	MP/S/KHA	Y
KER/S/IDU	Y	MP/S/KHE	Y
KER/S/NEY	Y	MP/S/NAR	Y
KER/S/PEE	N	MP/S/NAT	Y
KER/S/PEP	N	MP/S/NAU	Y
KER/S/PER	Y	MP/S/PAC	Y
KER/S/SHE	Y	MP/S/PAL	Y
KER/S/THA	N	MP/S/PAM	Y
KER/S/WYN	Y	MP/S/PAN	N
MAH/N/NAW	N	MP/S/PEN	Y
MAH/N/PEN	N	MP/S/PHE	N
MAH/N/SAN	Y	MP/S/RAT	Y
MAH/N/TAD	Y	MP/S/SAI	Y
MAH/S/BHI	N	MP/S/SAN	Y
MAH/S/BOR	Y	MP/S/SEM	Y
MAH/S/DEU	Y	MP/S/SIN	Y
MAH/S/DHA	N	MP/S/SIT	Y
MAH/S/GRE	Y	MP/S/SON	Y
MAH/S/KAL	Y	MP/S/TAM	Y
MAH/S/KAR	Y	MP/S/UDA	Y
MAH/S/KIN	Y	NAG/S/INT	N
MAH/S/MEL	N	ORI/N/SIM	Y
MAH/S/NAG	Y	ORI/S/BAI	N
MAH/S/NAN	N	ORI/S/BHI	Y
MAH/S/PHA	Y	ORI/S/CHA	Y
MAH/S/RAD	Y	ORI/S/HAD	N
MAH/S/TAN	Y	ORI/S/NAN	Y
MAH/S/YAW	Y	ORI/S/SAT	Y
MAN/N/KEI	Y	ORI/S/SIM	Y
MAN/N/SIR	N	RAJ/N/DES	Y
MEG/S/NCN	Y	RAJ/N/KEO	Y
MEG/S/SIJ	Y	RAJ/N/RAN	Y
MIZ/S/DAM	N	RAJ/N/SAR	Y
MP/N/BAN	Y	RAJ/S/BHE	Y
MP/N/FOS	N	RAJ/S/DAR	N
MP/N/IND	Y	RAJ/S/JAI	Y
MP/N/KANH	Y	RAJ/S/JAM	N
MP/N/KANG	N	RAJ/S/JAW	N
MP/N/MAD	Y	RAJ/S/KAI	N
MP/N/PAN	Y	RAJ/S/KUM	Y
MP/N/PEN	Y		
MP/N/SAN	Y		
MP/N/SAT	Y		

Table IV:1.2 (contd)

N/S	Existence of separate budget	N/S	Existence of separate budget
RAJ/S/MOU	Y	RAJ/S/KUM	Y
RAJ/S/NAH	N	RAJ/S/MOU	Y
RAJ/S/NAT	N	RAJ/S/NAH	N
RAJ/S/PHU	N	RAJ/S/NAT	N
RAJ/S/RAM	N	RAJ/S/PHU	N
RAJ/S/SAR	Y	RAJ/S/RAM	N
RAJ/S/SHE	N	RAJ/S/SAR	Y
RAJ/S/SIT	Y	RAJ/S/SHE	N
RAJ/S/TAL	Y	RAJ/S/SIT	Y
RAJ/S/TOD	Y	RAJ/S/TAL	Y
RAJ/S/VAN	Y	RAJ/S/TOD	Y
SIK/N/KHA	Y	RAJ/S/VAN	Y
MP/S/NAT	Y	SIK/N/KHA	Y
MP/S/NAU	Y	SIK/S/FAM	N
MP/S/PAC	Y	TN/N/GUI	Y
MP/S/PAL	Y	TN/S/ANA	N
MP/S/PAM	Y	TN/S/KAL	Y
MP/S/PAN	N	TN/S/MUD	Y
MP/S/PEN	Y	TN/S/MUN	Y
MP/S/PHE	N	TN/S/NIL	Y
MP/S/RAT	Y	TN/S/POI	Y
MP/S/SAI	Y	TN/S/PUL	N
MP/S/SAN	Y	TN/S/VED	N
MP/S/SEM	Y	UP/N/COR	Y
MP/S/SIN	Y	UP/N/DUD	Y
MP/S/SIT	Y	UP/N/NAN	Y
MP/S/SON	Y	UP/N/VAL	N
MP/S/TAM	Y	UP/S/CHA	N
MP/S/UDA	Y	UP/S/CHI	N
NAG/S/INT	N	UP/S/GOV	Y
ORI/N/SIM	Y	UP/S/KAI	N
ORI/S/BAI	N	UP/S/KAT	Y
ORI/S/BHI	Y	UP/S/KED	Y
ORI/S/CHA	Y	UP/S/KIS	N
ORI/S/HAD	N	UP/S/MAH	N
ORI/S/NAN	Y	UP/S/MOT	N
ORI/S/SAT	Y	UP/S/NAT	Y
ORI/S/SIM	Y	UP/S/NAW	N
RAJ/N/DES	Y	UP/S/RAJ	N
RAJ/N/KEO	Y	UP/S/RAN	Y
RAJ/N/RAN	Y	WB/N/SUN	N
RAJ/N/SAR	Y	WB/S/BAL	Y
RAJ/S/BHE	Y	WB/S/JAL	Y
RAJ/S/DAR	N	WB/S/RAM	Y
RAJ/S/JAI	Y	WB/S/SAJ	N
RAJ/S/JAM	N		
RAJ/S/JAW	N		
RAJ/S/KAI	N		

Table IV:1.3 Zoning

1		2	3	4	5	6
State/ U.T.		Total N/S	N/S res- ponding	N/S with zoning	4 as % of 3	Remarks
A & N	N	6	5	0	0	
	S	5	5	0	0	
	T	11	10	0	0	
AP						
	S & T	15	15	5	33	
Aru	N	1	1	1	100	
	S	4	4	0	0	
	T	5	5	1	20	
Bih						
	S & T	13	12	7	58	
Goa	N	1	1	1	100	Sanctuary BZ to national park
	S	3	3	1	33	
	T	4	4	2	50	
Guj	N	4	4	1	25	Sanctuary BZ to national park
	S	12	11	1	9	
	T	16	15	2	13	
Har						
	S & T	1	1	0	0	
HP	N	1	1	0	100	
	S	29	28	5	18	
	T	30	29	6	21	
J & K	N	3	2	1	50	
	S	6	5	0	0	
	T	9	7	1	14	
Kar	N	3	3	2	67	
	S	14	14	3	21	
	T	17	17	5	29	
Ker	N	3	3	1	33	
	S	11	11	0	0	
	T	14	14	1	7	
Mah	N	4	4	2	50	
	S	22	12	4	33	
	T	26	16	6	38	
Man						
	N & T	2	2	0	0	
Meg						
	S & T	2	2	1	50	BZ outside sanctuary
MP	N	11	10	2	20	BZ outside for one park
	S	31	29	5	17	
	T	42	39	7	18	
Nag						
	S & T	3	3	1	33	

Table IV:1.3 (contd)

1		2	3	4	5	6
State/ U.T.		Total N/S	N/S res- ponding	N/S with zoning	4 as % of 3	Remarks
Ori	N	1	1	1	100	
	S	14	14	2	14	
	T	15	15	3	20	
Raj.	N	4	4	2	50	
	S	18	17	1	6	
	T	22	21	3	14	
Sik	N	1	1	0	0	
	S	3	1	0	0	
	T	4	2	0	0	
TN	N	1	1	0	0	
	S	10	9	1	11	
	T	11	10	1	10	
UP	N	4	4	2	50	
	S	13	13	0	0	
	T	17	17	2	12	
WB	N	1	1	1	100	
	S	13	12	4	33	
	T	14	13	5	38	
All India	N	51	48	18	38	
	S	242	221	41	19	
	T	293	269	59	22	



Table IV: 2.1 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- ponding (Nos.)	No. of N/S with work	4 as % of 3	Description of work done (in no. of N/S)	No. of N/S in which work done for							
						Fuel wood	7 as % of 4	Fod- der	9 as % of 4	Raw mat- erial	11 as % of 4	Other purpo- ses	13 as % of 4
Ker	N	3	2	0	0								
	S	11	6	0	0								
	T	14	8	0	0								
Mah	N	4	4	0	0								
	S	22	9	1	11	Fuelwood & fodder species	1	100	1	100			
	T	26	13	1	8								
Man	N & T	2	1	0	0								
Meg	S & T	2	2	0	0								
MP	N	11	4	0	0								
	S	31	19	7	37	Grass plantations (2), Bamboo & Timber (2), Plantation (1), Sanctuary land fenced & Developed as pasture land for cattle(1), Felling, collection, and transportation of trees(1)	3	43	3	43		3	43
	T	42	23	7	30								
Nag	S & T	3	1	0	0								
Ori	N	1	0										
	S	14	6	3	50	Firewood & timber depots (2) & commercial felling (1)	2	67				3	100
	T	15	6	3	50								
Raj	N	4	2	0	0								
	S	18	7	0	0								
	T	22	9	0	0								

Table IV: 2.1 (contd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
State/ U.T.	Total N/S	N/S res- ponding (Nos.)	No. of N/S with work	4 as % of 3	Description of work done (in no. of N/S)	No. of N/S in which work done for							
						Fuel wood	7 as % of 4	Fod- der	9 as % of 4	Raw mat- erial	11 as % of 4	Other purpo- ses	13 as % of 4
Sik	N	1	1	0	0								
	S	3	1	0	0								
	T	4	2	0	0								
TN	N	1	1	100	Raising of fodder grass(1)			1	100				
	S	10	6	0	0								
	T	11	7	14									
UP	N	4	3	0	0								
	S	13	10	1	10	Tree plantation(1)	1	100	1	100			
	T	17	13	8									
WB	N	1	1	0	0								
	S	13	7	43	Fodder plantation(2), Agro-forestry & social forestry scheme (1)	1	33	3	100				
	T	14	8	38									
All	N	51	30	7									
India	S	242	134	15		0	0	2	100	0	0	0	0
	T	293	164	13		12	60	9	45	0	0	6	30
						12	55	11	50	0	0	6	27

Table IV: 2.2 Relocation of Human Population

1	2	3	4	5	6	7	8	9	10	11
State/ U.T.	Total N/S	N/S res- pon- ding	N/S with pop. in- side	N/S propo- sing rel- ocation till 1984	5 as % of 4	N/S relo- cating till 1984	7 as % of 4	7 as % of 5	N/S propo- sing rel- ocation after 1984	10 as % of 4
A&N	N 6 S 5 T 11	5 4 9	0 0 0							
AP	S&T 15	10	8	0	0	0	0	0	3	38
Aru	N 1 S 4 T 5	1 3 4	0 1 1	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Bih	S&T 13	7	6	1	17	1	17	100	0	0
Goa	N 1 S 3 T 4	1 2 3	0 1 1	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Guj	N 4 S 12 T 16	3 7 10	1 2 3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Har	S&T 1	1	0							
HP	N 1 S 29 T 30	1 16 17	1 10 11	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
J&K	N 3 S 6 T 9	1 1 2	0 1 1	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Kar	N 3 S 14 T 17	3 14 17	1 6 7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 1 1	0 17 14
Ker	N 3 S 11 T 14	3 7 10	2 2 4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 1 1	0 25 25
Mah	N 4 S 22 T 26	4 6 10	3 5 8	0 1 1	0 20 13	0 1 1	0 20 13	0 100 100	0 1 1	0 20 13
Man	N&T 2	1	0							
Meg	S&T 2	2	0							
MP	N 11 S 31 T 42	8 25 33	5 19 24	2 1 3	40 5 13	2 1 3	40 5 13	100 100 100	3 3 6	60 16 25

Table IV: 2.2 (contd)

1	2	3	4	5	6	7	8	9	10	11
State/ U.T.	Total N/S	N/S res- pon- ding	N/S with pop. in- side	N/S propo- sing re- location till 1984	5 as % of 4	N/S relo- cating till 1984	7 as % of 4	7 as % of 5	N/S propo- sing re- location after 1984	10 as % of 4
Nag S&T	3	0								
Ori	N 1 S 14 T 15	0 5 5	3 3	1 1	33 33	0 0	0 0	0 0	1 1	33 33
Raj	N 4 S 18 T 22	4 15 19	2 8 10	2 0 2	100 0 20	1 0 1	50 0 10	50 0 50	2 1 3	100 13 30
Sik	N 1 S 3 T 4	1 1 2	0 0 0							
TN	N 1 S 10 T 11	1 5 6	0 4 4	0 0	0 0	0 0	0 0	0 0	1 1	25 25
UP	N 4 S 13 T 17	4 8 12	1 7 8	1 0 1	100 0 13	1 0 1	100 0 13	100 0 100	1 1 2	100 14 25
WB	N 1 S 13 T 14	0 8 8	5 5	0 0	0 0	0 0	0 0	0 0	0 0	0 0
All India	N 51 S 242 T 293	41 147 188	16 88 104	5 4 9	31 5 9	4 3 7	25 3 7	80 75 78	6 13 19	38 15 18

All the N/S which proposed relocation between 1979 to 1984, barring one sanctuary in Bihar, have also proposed to relocate after 1984.

In addition, one national park and 10 sanctuaries who had not earlier proposed relocation, have done so for the period after 1983-84.

The total proposing relocation from 1979 till date of response is 6 parks and 14 sanctuaries.

Table IV: 2.3 Compensation Payable for Livestock Injury/Death by Wild Animals

1		2	3	4	5	6	7	8	9
State/ U.T.		Total N/S	N/S res- pond- ing	Compensation payable					
				Within N/S	4 as % of 3	In adja- cent areas	6 as % of 3	Within & in ad- cent areas	8 as % of 3
A&N	N	6	5	0	0	0	0	0	0
	S	5	4	0	0	0	0	0	0
	T	11	9	0	0	0	0	0	0
AP	S&T	15	14	7	50	6	43	5	36
Aru	N	1	1	0	0	0	0	0	0
	S	4	4	0	0	0	0	0	0
	T	5	5	0	0	0	0	0	0
Bih	S&T	13	9	2	22	0	0	0	0
Goa	N	1	1	0	0	0	0	0	0
	S	3	3	0	0	0	0	0	0
	T	4	4	0	0	0	0	0	0
Guj	N	4	4	2	50	1	25	1	25
	S	12	10	5	50	4	40	4	40
	T	16	14	7	50	5	36	5	36
Har	S&T	1	1	1	100	1	100	1	100
HP	N	1	1	0	0	0	0	0	0
	S	29	25	4	16	4	16	4	16
	T	30	26	4	15	4	15	4	15
J&K	N	3	2	0	0	0	0	0	0
	S	6	1	1	100	0	0	0	0
	T	9	3	1	33	0	0	0	0
Kar	N	3	3	1	33	3	100	1	33
	S	14	12	7	58	9	75	7	58
	T	17	15	8	53	12	80	8	53
Ker	N	3	2	0	0	1	50	0	0
	S	11	9	3	33	4	44	3	33
	T	14	11	3	27	5	45	3	27
Mah	N	4	4	1	25	1	25	1	25
	S	22	10	2	20	3	30	2	20
	T	26	14	3	21	4	29	3	21
Man	N&T	2	1	0	0	0	0	0	0
Meg	S&T	2	2	0	0	2	100	0	0
MP	N	11	10	4	40	7	70	4	40
	S	31	26	16	62	19	73	14	54
	T	42	36	20	56	26	72	18	50

Table IV: 2.3 (contd)

1		2	3	4	5	6	7	8	9
State/ U.T.		Total N/S	N/S res- pond- ing	Compensation payable					
				Within N/S	4 as % of 3	In adja- cent areas	6 as % of 3	Within & in adj- cent areas	8 as % of 3
Nag	S&T	3	1	0	0	0	0	0	0
Ori	N	1	0						
	S	14	6	1	17	0	0	0	0
	T	15	6	1	17	0	0	0	0
Raj	N	4	4	1	25	1	25	1	25
	S	18	16	1	6	1	6	1	6
	T	22	20	2	10	2	10	2	10
Sik	N	1	1	0	0	1	100	0	0
	S	3	1	0	0	1	100	0	0
	T	4	2	0	0	2	100	0	0
TN	N	1	1	0	0	0	0	0	0
	S	10	7	0	0	4	57	0	0
	T	11	8	0	0	4	50	0	0
UP	N	4	4	1	25	4	100	1	25
	S	13	12	7	58	6	50	5	42
	T	17	16	8	50	10	63	6	38
WB	N	1	1	0	0	1	100	0	0
	S	13	9	0	0	5	56	0	0
	T	14	10	0	0	6	60	0	0
All India	N	51	45	10	22	20	44	9	20
	S	242	182	57	31	59	32	46	25
	T	293	227	67	30	79	35	55	24

Table IV: 2.4 Compensation Payable for Damage to Crops by Wild Animals

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- ponding	Compensation payable					
			Within N/S	4 as % of 3	In adjacent areas	6 as % of 3	Within & in adjac- cent areas	8 as % of 3
A&N	N	6	5	0	0	0	0	0
	S	5	5	0	0	0	0	0
	T	11	10	0	0	0	0	0
AP	S&T	15	12	0	0	0	0	0
Aru	N	1	1	0	0	0	0	0
	S	4	3	0	0	0	0	0
	T	5	4	0	0	0	0	0
Bih	S&T	13	9	2	22	2	22	11
Goa	N	1	1	0	0	0	0	0
	S	3	3	0	0	0	0	0
	T	4	4	0	0	0	0	0
Guj	N	4	4	0	0	0	0	0
	S	12	10	1	10	1	10	10
	T	16	14	1	7	1	7	7
Har	S&T	1	1	0	0	0	0	0
HP	N	1	1	0	0	0	0	0
	S	29	26	1	4	1	4	4
	T	30	27	1	4	1	4	4
J&K	N	3	1	0	0	0	0	0
	S	6	1	0	0	0	0	0
	T	9	2	0	0	0	0	0
Kar	N	3	3	1	33	2	67	0
	S	14	14	6	43	8	57	36
	T	17	17	7	41	10	59	29
Ker	N	3	2	0	0	1	50	0
	S	11	10	4	40	6	60	40
	T	14	12	4	33	7	58	33
Mah	N	4	4	0	0	0	0	0
	S	22	9	0	0	0	0	0
	T	26	13	0	0	0	0	0
Man	N&T	2	1	0	0	0	0	0
Meg	S&T	2	2	2	100	2	100	100
MP	N	11	9	0	0	1	11	0
	S	31	31	2	6	3	10	10
	T	42	40	2	5	4	10	8

Table IV: 2.4 (contd)

1		2	3	4	5	6	7	8	9
State/ U.T.		Total N/S	N/S res- ponding	Compensation payable					
				Within N/S	4 as % of 3	In adjacent areas	6 as % of 3	Within & in adja- cent areas	8 as % of 3
Nag	S&T	3	1	0	0	1	100	0	0
Ori	N	1	0						
	S	14	6	0	0	0	0	0	0
	T	15	6	0	0	0	0	0	0
Raj	N	4	4	1	25	1	25	1	25
	S	18	17	1	6	1	6	1	6
	T	22	21	2	10	2	10	2	10
Sik	N	1	1	0	0	0	0	0	0
	S	3	1	0	0	0	0	0	0
	T	4	2	0	0	0	0	0	0
TN	N	1	1	0	0	0	0	0	0
	S	10	7	0	0	0	0	0	0
	T	11	8	0	0	0	0	0	0
UP	N	4	4	0	0	0	0	0	0
	S	13	12	0	0	0	0	0	0
	T	17	16	0	0	0	0	0	0
WB	N	1	1	0	0	0	0	0	0
	S	13	8	0	0	1	13	0	0
	T	14	9	0	0	1	11	0	0
All India	N	51	43	2	5	5	12	1	2
	S	242	188	19	10	26	14	18	10
	T	293	231	21	9	31	13	19	8

Table IV: 2.6 Vaccination for Cattle

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having vaccination	4 as % of 3
A & N				
N	6	5	0	0
S	5	4	0	0
T	11	9	0	0
AP				
S & T	15	13	9	69
Aru				
N	1	1	1	100
S	4	5	1	20
T	5	6	2	33
Bih				
S & T	13	9	1	11
Goa				
N	1	1	0	0
S	3	3	2	67
T	4	4	2	50
Guj				
N	4	4	0	0
S	12	10	1	10
T	16	14	1	7
Har				
S & T	1	1	1	100
HP				
N	1	1	0	0
S	29	27	3	11
T	30	28	3	11
J & K				
N	3	2	1	50
S	6	4	3	75
T	9	6	4	67
Kar				
N	3	2	2	100
S	14	14	8	57
T	17	16	10	63
Ker				
N	3	3	1	33
S	11	9	3	33
T	14	12	4	33
Mah				
N	4	3	1	33
S	22	10	1	10
T	26	13	2	15
Man				
N & T	2	1	1	100
Meg				
S & T	2	2	0	0
MP				
N	11	10	5	50
S	31	29	7	24
T	42	39	12	31
Nag				
S & T	3	0		

Table IV: 2.6 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having vaccination	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	1	14
	T	15	8	1	13
Raj	N	4	4	2	50
	S	18	18	3	17
	T	22	22	5	23
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	7	3	43
	T	11	8	3	38
UP	N	4	4	2	50
	S	13	12	2	17
	T	17	16	4	25
WB	N	1	1	0	0
	S	13	8	4	50
	T	14	9	4	44
All India	N	51	45	16	36
	S	242	193	53	27
	T	293	238	69	29

Table IV: 2.6a Vaccination of Cattle Living Inside (Extended Database)

N/S	No. of cattle	Existence of vaccination	N/S	No. of cattle	Existence of vaccination
AP/S/ETU	9800	Y	MP/S/BAG	19734	N
AP/S/KIN	2000	N	MP/S/BAR	6842	N
AP/S/PAK	24500	Y	MP/S/BOR	4773	N
AP/S/PRA	1000	N	MP/S/GAN	681	N
ARU/S/LAL	50	N	MP/S/GHA	10536	N
BIH/S/BHI	6000	N	MP/S/GOM	1500	N
BIH/S/DAL	50	N	MP/S/KAR	22660	N
BIH/S/GAU	5000	N	MP/S/KEN	4902	N
BIH/S/HAZ	10000	N	MP/S/KHA	19975	N
BIH/S/LAW	15000	N	MP/S/KHE	150	N
BIH/S/PAL	20000	Y	MP/S/NAR	1205	N
BIH/S/TOF	19	N	MP/S/NAU	26492	N
BIH/S/VAL	5000	N	MP/S/PAC	18000	N
GOA/N/BHA	2000	N	MP/S/PAL	4485	N
GOA/S/BHA	2000	N	MP/S/PAN	2391	N
GOA/S/COT	450	Y	MP/S/PHE	30	N
GUJ/N/GIR	16947	N	MP/S/RAT	1632	Y
GUJ/S/BAR	5500	N	MP/S/SAN	10273	Y
GUJ/S/DUM	4000	N	MP/S/SEM	22500	N
GUJ/S/JES	5000	N	MP/S/SIN	4500	N
GUJ/S/NAR	3563	Y	MP/S/SIT	6855	N
GUJ/S/RAT	567	N	MP/S/TAM	1030	N
HP/N/GRE	510	N	MP/S/UDA	1250	N
HP/S/CHA	6451	N	ORI/N/SIM	5500	N
HP/S/DARA	1868	N	ORI/S/BHI	1000	N
HP/S/KAL	40	N	ORI/S/HAD	500	N
HP/S/KAN	375	N	ORI/S/NAN	105	Y
HP/S/KUG	375	Y	ORI/S/SAT	12000	N
HP/S/NAI	1000	N	ORI/S/SIM	5500	N
HP/S/PON	30000	N	RAJ/N/DES	17637	N
HP/S/RUP	3967	N	RAJ/N/RAN	643	N
HP/S/SEC	1289	N	RAJ/S/BHE	2000	N
HP/S/TUN	966	N	RAJ/S/DAR	3000	N
J & K/N/KIS	163	N	RAJ/S/JAW	2500	N
KAR/S/BHA	3000	Y	RAJ/S/KUM	787	N
KAR/S/DAN	70000	N	RAJ/S/MOU	238	N
KAR/S/MOO	1500	Y	RAJ/S/PHU	1200	N
KAR/S/SHA	10000	Y	RAJ/S/RAM	10000	N
KAR/S/SHE	52000	Y	RAJ/S/SHE	250	N
KAR/S/SOM	2000	Y	RAJ/S/SIT	1250	N
KER/S/NEY	500	N	RAJ/S/TOD	490	N
KER/S/PAR	450	Y	TN/S/ANA	550	Y
MAH/S/GRE	108193	N	TN/S/MUN	1400	N
MAH/S/KIN	8570	N	UP/N/DUD	16000	N
MAH/S/MEL	20653	Y	UP/S/CHI	3380	Y
MAH/S/TAN	4976	N	UP/S/KAI	5643	N
MAH/S/YAW	700	N	UP/S/MOT	367	N
MP/N/BAN	2490	Y	UP/S/RAJ	4435	N
MP/N/IND	13860	N	WB/S/JAL	200	N
MP/N/SAT	800	N			
MP/S/ACH	2800	N			
MP/S/BAD	600	Y			

## Consolidated figures:

National Parks with vaccination: 1 (out of 11 reporting grazing)

Sanctuaries with vaccination: 20 (out of 90 reporting grazing)

Table IV: 2.6b Vaccination of Cattle from Adjacent Villages  
(Extended Database)

N/S	No. of cattle	Existence of vaccination	N/S	No. of cattle	Existence of vaccination
AP/S/COR	150	N	MP/S/ACH	5000	N
AP/S/ETU	33000	Y	MP/S/BAD	5000	Y
AP/S/KAW	8000	Y	MP/S/BAG	29537	N
AP/S/KIN	10000	Y	MP/S/BOR	258	N
AP/S/MAN	2000	Y	MP/S/GAN	2185	N
AP/S/PAK	18000	Y	MP/S/GHA	2540	N
AP/S/PAP	3168	N	MP/S/GOM	10000	N
AP/S/POC	10000	N	MP/S/KEN	4898	N
AP/S/PRA	10000	Y	MP/S/KHA	4475	N
AP/S/SIW	2000	Y	MP/S/KHE	4000	Y
ARU/S/LAL	500	N	MP/S/NAR	15046	N
BIH/S/BHI	4000	N	MP/S/NAU	31087	N
BIH/S/DAL	700	N	MP/S/PAC	2000	Y
BIH/S/GAU	2000	N	MP/S/PAL	450	N
BIH/S/HAZ	7300	N	MP/S/PEN	3000	Y
BIH/S/PAL	10000	Y	MP/S/PHE	1470	N
BIH/S/RAJ	4500	N	MP/S/RAT	9316	N
BIH/S/TOP	295	N	MP/S/SAI	20000	N
BIH/S/VAL	8000	N	MP/S/SAN	200	Y
GOA/S/BON	100	Y	MP/S/SEM	4500	N
GOA/S/COT	550	Y	MP/S/SIN	2000	N
GUJ/N/VEL	50	N	MP/S/SIT	1980	Y
GUJ/S/DHR	5000	N	MP/S/TAM	4052	N
GUJ/S/DUM	5500	N	MP/S/UDA	2000	N
GUJ/S/JES	10000	N	ORI/N/SIM	8550	Y
GUJ/S/KHI	75	N	ORI/S/HAD	1500	N
GUJ/S/NAL	13854	N	ORI/S/SAT	45000	N
GUJ/S/NAR	500	Y	ORI/S/SIM	8550	Y
GUJ/S/RAT	112	N	RAJ/N/SAR	3677	Y
HAR/S/SUL	50	Y	RAJ/S/BHE	2000	N
HP/N/PIN	518	N	RAJ/S/DAR	3000	N
HP/S/KAL	210	N	RAJ/S/JAW	1000	N
HP/S/KUG	400	Y	RAJ/S/KAI	10000	N
HP/S/PON	10000	N	RAJ/S/KUM	5000	N
HP/S/REN	700	Y	RAJ/S/MOU	1500	N
HP/S/TAL	1000	N	RAJ/S/PHU	2700	N
HP/S/TIR	135	N	RAJ/S/RAM	15000	N
HP/S/TUN	2238	N	RAJ/S/SAR	3677	Y
KAR/N/BAND	2000	Y	RAJ/S/SHE	2160	N
KAR/N/BANN	200	Y	RAJ/S/SIT	2500	N
KAR/S/BHA	4000	Y	RAJ/S/TOD	5000	N
KAR/S/BLA	8400	N	SIK/S/FAM	80	N
KAR/S/MOO	20000	Y	TN/S/ANA	2640	Y
KAR/S/SHA	2000	Y	TN/S/POI	148	Y
KAR/S/SHE	55000	Y	UP/S/CHI	3314	Y
KAR/S/SOM	100	Y	UP/S/KAI	5643	N
KER/N/PER	2200	Y	UP/S/KAT	4000	Y
KER/S/CHIM	100	N	UP/S/KIS	7700	N
KER/S/WYN	1500	Y	UP/S/MOT	292	N
MAH/S/DHA	11447	Y	UP/S/NAW	250	N
MAH/S/KAR	20	N	UP/S/RAJ	600	N
MAH/S/KIN	10488	Y	WB/S/JAL	1000	N
MAH/S/TAN	2427	N			
MAN/N/KEI	10000	Y			

## Consolidated figures:

National Parks with vaccination: 6 (out of 8 reporting grazing)

Sanctuaries with vaccination: 35 (out of 100 reporting grazing)

Table IV: 2.7 Say of Wildlife Wing in Areas to be Opened for Tourism, and in Mode of Travel, Activities etc., of Tourists

1	2	3	4	5	6	7	8
		Say in areas to be opened			Say in mode of travel		
State/ U.T.	Total N/S	N/S res- ponding	N/S with say	4 as % of 3	N/S res- ponding	N/S with say	7 as % of 6
A & N	N	6	4	75	5	4	80
	S	5	2	100	4	3	75
	T	11	6	83	9	7	78
AP	S & T	15	13	85	13	11	85
Aru	N	1	1	0	1	0	0
	S	4	3	67	3	2	67
	T	5	4	50	4	2	50
Bih	S & T	13	8	75	8	7	88
Goa	N	1	1	100	1	1	100
	S	3	3	67	3	2	67
	T	4	4	75	4	3	75
Guj	N	4	4	100	4	4	100
	S	12	10	80	10	10	100
	T	16	14	86	14	14	100
Har	S & T	1	1	100	1	1	100
HP	N	1	0		0		
	S	29	27	7	26	8	31
	T	30	27	7	26	8	31
J & K	N	3	2	100	2	2	100
	S	6	4	100	4	4	100
	T	9	6	100	6	6	100
Kar	N	3	3	67	3	3	100
	S	14	14	64	14	12	86
	T	17	17	65	17	15	88
Ker	N	3	3	100	3	3	100
	S	11	6	67	9	7	78
	T	14	9	78	12	10	83
Mah	N	4	3	33	4	2	50
	S	22	9	100	10	9	90
	T	26	12	83	14	11	79
Man	N & T	2	1	100	0		
Meg	S & T	2	2	100	2	2	100
MP	N	11	8	88	8	7	88
	S	31	26	69	26	17	65
	T	42	34	74	34	24	71

Table IV: 2.7 (contd)

1		2	3	4	5	6	7	8
State/ U.T.		Total N/S	Say in areas to be opened			Say in mode of travel		
			N/S res- ponding	N/S with say	4 as % of 3	N/S res ponding	N/S with say	7 as % of 6
Nag	S & T	3	1	1	100	1	1	100
Ori	N	1	0			0		
	S	14	7	4	57	7	6	86
	T	15	7	4	57	7	6	86
Raj	N	4	3	3	100	4	4	100
	S	18	16	12	75	15	12	80
	T	22	19	15	79	19	16	84
Sik	N	1	1	1	100	1	1	100
	S	3	0			1	1	100
	T	4	1	1	100	2	2	100
TN	N	1	1	1	100	1	1	100
	S	10	7	7	100	7	6	86
	T	11	8	8	100	8	7	88
UP	N	4	3	2	67	3	2	67
	S	13	11	3	27	11	5	45
	T	17	14	5	36	14	7	50
WB	N	1	1	1	100	1	0	0
	S	13	9	9	100	9	7	78
	T	14	10	10	100	10	7	70
All India	N	51	39	32	82	41	34	83
	S	242	179	121	68	184	133	72
	T	293	218	153	70	225	167	74

Table IV: 2.8 Research

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with research	4 as % of 3
A&N	N	6	2	0	0
	S	5	4	1	25
	T	11	6	1	17
AP					
	S&T	15	12	3	25
Aru	N	1	1	1	100
	S	4	2	1	50
	T	5	3	2	67
Bih					
	S&T	13	6	1	17
Goa	N	1	1	0	0
	S	3	3	0	0
	T	4	4	0	0
Guj	N	4	3	2	67
	S	12	11	3	27
	T	16	14	5	36
Har					
	S&T	1	1	0	0
HP	N	1	1	1	100
	S	29	22	5	23
	T	30	23	6	26
J&K	N	3	2	1	50
	S	6	3	0	0
	T	9	5	1	20
Kar	N	3	2	0	0
	S	14	12	3	25
	T	17	14	3	21
Ker	N	3	2	1	50
	S	11	10	1	10
	T	14	12	2	17
Mah	N	4	3	0	0
	S	22	9	2	22
	T	26	12	2	17
Man					
	N&T	2	1	0	0
Meg					
	S&T	2	2	0	0
MP	N	11	9	3	33
	S	31	23	5	22
	T	42	32	8	25
Nag					
	S&T	3	0		

Table IV: 2.8 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with research	4 as % of 3
Ori	N	1	1	1	100
	S	14	7	4	57
	T	15	8	5	63
Raj	N	4	3	3	100
	S	18	14	2	14
	T	22	17	5	29
Sik	N	1	1	0	0
	S	3	0		
	T	4	1	0	0
TN	N	1	1	0	0
	S	10	8	4	50
	T	11	9	4	44
UP	N	4	4	2	50
	S	13	9	2	22
	T	17	13	4	31
WB	N	1	1	1	100
	S	13	8	1	13
	T	14	9	2	22
All India	N	51	38	16	42
	S	242	166	38	23
	T	293	204	54	26

Table IV: 2.9 Monitoring Activities

1	2	3	4	5
State/ U.T.	Total N/S	N/S responding	N/S with monitoring	4 as % of 3
A&N	N 6	4	0	0
	S 5	5	0	0
	T 11	9	0	0
AP	S&T 15	14	1	7
Aru	N 1	1	1	100
	S 4	4	0	0
	T 5	5	1	20
Bih	S&T 13	8	1	13
Goa	N 1	1	1	100
	S 3	3	3	100
	T 4	4	4	100
Guj	N 4	4	0	0
	S 12	11	0	0
	T 16	15	0	0
Har	S&T 1	1	0	0
HP	N 1	1	0	0
	S 29	28	0	0
	T 30	29	0	0
J&K	N 3	2	0	0
	S 6	4	3	75
	T 9	6	3	50
Kar	N 3	2	0	0
	S 14	14	0	0
	T 17	16	0	0
Ker	N 3	3	1	33
	S 11	10	0	0
	T 14	13	1	8
Mah	N 4	4	0	0
	S 22	10	2	20
	T 26	14	2	14
Man	N&T 2	1	0	0
Meg	S&T 2	2	0	0
MP	N 11	11	2	18
	S 31	28	2	7
	T 42	39	4	10
Nag	S&T 3	0		

Table IV: 2.9 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with monitoring	4 as % of 3
Ori	N	1	1	1	100
	S	14	7	3	43
	T	15	8	4	50
Raj	N	4	4	1	25
	S	18	16	1	6
	T	22	20	2	10
Sik	N	1	1	1	100
	S	3	1	1	100
	T	4	2	2	100
TN	N	1	1	0	0
	S	10	8	0	0
	T	11	9	0	0
UP	N	4	4	0	0
	S	13	10	2	20
	T	17	14	2	14
WB	N	1	1	1	100
	S	13	9	2	22
	T	14	10	3	30
All India	N	51	46	9	20
	S	242	193	21	11
	T	293	239	30	13

Table IV: 2.10 Association of Experts

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experts	4 as % of 3	Name of the expert and specialisation	Institution to which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
A & N	N 6	5	0	0					
	S 5	1	0	0					
	T 11	6	0	0					
AP	S & T 15	14	1	7	J.B. Sale	FAO	UNDP	1980-83	Management plan
					H.R. Bustard	FAO	UNDP	1980	Crocodile breed- ing programme
Assam	N 1	1	0	0					
	S 4	3	0	0					
	T 5	4	0	0					
Bihar	S & T 13	9	1	11	V.P. Lowe	Merdewood Research Centre, Cumbria	WWF & GOI	5 days-Feb/86	Monitoring abun- dance of prey
					J.M. Sykes and A.D. Horril	Merdewood Research Centre, Cumbria	WWF & GOI	Nov.-Dec.'76	Monitoring vege- tational changes
					L.K. Banerjee	Botanical Survey of India, Calcutta	BSI & Project Tiger	15.3.83 to 19.3.83 and in Sept.'83	Checklist of flora
					S.M. Ali	ZSI, Calcutta	ZSI & GOI	10.6.83 to 14.6.83	Faunal life in the Palamau tiger reserve
Goa	N 1	0							
	S 3	2	0	0					
	T 4	2	0	0					

Table IV: 2.10 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experts	4 as % of 3	Name of the expert and specialisation	Institution to which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
Gj	N 4 S 12	4 10	0 1	0 10	Ruben David Officers Duleep Mathai	Kankaria Zoo, Ahmedabad U.S. National Park Service WWF-I			
	T 16	14	1	7					
Har	S & T 1	1	1	100	M. Krishnan		Haryana Govt.	Sept. 72	Submitted plan for the development of sanctuary
HP	N 1 S 29	0 24	3	13	A.J. Gaston	Canadian Wildlife Service, Ottawa, Ontario, Canada	Govt. of India	1979-80 & 1981-82	Studies regarding the proposed National Park, General status survey of Himalayan flora & fauna (as above)
					M.L. Hunter and P.J. Carson	University of Newcastle- upon-Tyne, England		March 1 to April 24 1983	
J & K	T 30 N 3	24 2	3 1	13 50	Collin Holloway, ecologist Fred Kurt, ecologist	WWF-Morges, Switzerland Deptt. of Ecology & Environment	WWF WWF-Morges, Switzerland	Periodically from 1975-80 (as above)	Ecological study of the Kashmir stag (as above)
	S 6 T 9	4 6	0 1	0 17					

Table IV: 2.10 (contd.)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experts	4 as % of 3	Name of the expert and specialisation	Institution to which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
Kar	N 3	3	1	33	Maumath Kunwar	BNHS, Bombay	Forest Deptt.	1981 onwards	Advice on snake park maintenance
	S 14	14	1	7	A.R. Rahmani	BNHS	BNHS	1982 onwards	Study of the habi- tat of the Great Indian Bustard
					Ullas Karanth and Mewa Singh	Univ. of Mysore	Univ. of Mysore		Status survey of Ranebenur Black Buck S.
	T 17	17	2	12					
Ker	N 3	2	0	0					
	S 11	11	1	9	R. Sugatham, ornithologist	BNHS	BNHS	Started 1984	Watching movement of birds
	T 14	13	1	8					
Mah	N 4	4	0	0					
	S 22	10	2	20	J.H. Sabnis	VMV (Amt)	Voluntary	1976-78	Food habits of carnivores by study of hair in scats in Melghat Tiger Reserve
					S.B. Chaphekar	IIS (Bombay)	Voluntary	1976-77	Ecology of Mel- ghat Tiger Reserve
					Officials	BSI	GOI	1976 onwards	Exploration of the flora of Mel- ghat Tiger Reserve

Table IV: 2.10 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experts	4 as % of 3	Name of the expert and specialisation	Institution to which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
Mah					A.R. Rahmani, ornithologist, and Ranjit Manaka- dan, ornithologist	BNHS	Deptt of Wild- life, Ministry of Agriculture, GOI	April 10, 1981 to date & continuing	A complete study of the ecology of the Great Indian Bustard, its beha- viour, habitat, movement, to suggest conserva- tion measures for this endangered species
T	26	14	2	14					
Man									
N & T	2	1	0	0					
Meg									
S & T	2	2	0	0					
MP									
N	11	9	1	11	Pushp Kumar	CF, Wildlife, Govt. of Andhra Pradesh	GOI	2-3 days	Layout of zoo- logical park and enclosures (As above)
S	31	28	1	4	J.H. Desai A.R. Rahmani and his assistants	Delhi Zoo BNHS	GOI Chief Wildlife Warden (MP)	1 day Since 1982	Study on the Great Indian Bustard
T	42	37	2	5					
Nag									
S & T		3	1	0	0				

Table IV: 2.10 (contd.)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experts	4 as % of 3	Name of the expert and specialisation	Institution to which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
Or	N S	1 14	0 6	3 50	L.A.K. Singh	Forest Department	Forest Deptt	1975-79	Involved in growth & release programme of gharials Status survey, guiding basic and fundamental research, and breeding and release pro- gramme of cro- codiles
					H.R. Bustard, herpetologist	FAO	FAO/UNDP/ GOI	1975-79	Identification of reservoirs with potential for cro- codile introduc- tion
	T	15	6	3	50			1976-79	
Raj	N S	4 18	4 16	0 3	19	J. Savidge	FAO	Dec. 1977	Status survey of gharial popula- tion
					L.A.K. Singh	Wildlife Insti- tute of India	Wildlife Insti- tute of India	Feb. 1984	Status survey of gharial popula- tion
					B. Warhauna & K. Scherrer, ornithologists			23.11.83	
					K.S. Sankhala	DOE, GOI		1.10.84	
	T	22	20	3	15				

Table IV: 2.10 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experis	4 as % of 3	Name of the expert and specialisation	Institution o which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
Sik	N 1 S 3 T 4	1 1 2	0 0 0	0 0 0					
TN	N 1 S 10 T 11	1 6 7	0 3 3	0 50 43	Ajit Kumar  Officials John Singh  Periyaswamy Rauf Ali Elizabeth Carymungal R. Sugathan and S.A. Hussein	Cambridge Univ., England  ZSI BNHS  Research student Univ. of Texas  BNHS, Bombay BNHS, Bombay S.A. Hussein	BNHS  ZSI BNHS  Forest Deptt WWF, BNHS Univ. of Texas, USA BNHS, Bombay	1977-80    Mar. 1980 Since 1980	Habits & habitat of liontailed macaque Primate studies Feeding & migra- tory habits of Asian elephant Ecology of giant squirrel Primate studies Research on Black buck Research on birds
UP	N 4 S 13 T 17	4 12 16	0 1 1	0 8 6	L.A.K. Singh	Wildlife Insti- tute of India	GOI		Research & study of crocodiles

Table IV: 2.10 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S having experts	4 as % of 3	Name of the expert and specialisation	Institution to which the expert belonged	Who sponsored the expert's association with the park	Dates of association	Work done by expert
WB	N 1	1	0	0					
	S 13	8	0	0					
	T 14	9	0	0					
All									
India	N 51	42	3	7					
	S 242	183	22	12					
	T 293	225	25	11					

## Abbreviations used:

BNHS: Bombay Natural History Society  
 BSI: Botanical Survey of India  
 CF: Conservator of Forests  
 DOE: Department of Environment  
 FAO: Food and Agricultural Organisation of the United Nations  
 GOI: Government of India  
 IIS: (full form not known)  
 UNDP: United Nations Development Programme  
 Univ: University  
 U.S.: United States of America  
 VMV (Amt): (full form not known)  
 WWF: World Wide Fund for Nature (formerly World Wildlife Fund)  
 WWF-I: World Wide Fund for Nature-India  
 ZSI: Zoological Survey of India

Table IV: 2.11 Literature on N/S

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with literature	4 as % of 3
A&N	N	6	4	0	0
	S	5	5	0	0
	T	11	9	0	0
AP					
	S&T	15	14	0	0
Aru	N	1	1	1	100
	S	4	4	1	25
	T	5	5	2	40
Bih					
	S&T	13	9	4	44
Goa	N	1	1	1	100
	S	3	3	2	67
	T	4	4	3	75
Guj	N	4	4	2	50
	S	12	11	5	45
	T	16	15	7	47
Har					
	S&T	1	0		
HP	N	1	1	0	0
	S	29	28	2	7
	T	30	29	2	7
J&K	N	3	2	1	50
	S	6	4	0	0
	T	9	6	1	17
Kar	N	3	2	2	100
	S	14	14	3	21
	T	17	16	5	31
Ker	N	3	3	1	33
	S	11	11	4	36
	T	14	14	5	36
Mah	N	4	4	4	100
	S	22	10	5	50
	T	26	14	9	64
Man					
	N&T	2	1	0	0
Meg					
	S&T	2	2	0	0
MP	N	11	11	6	55
	S	31	30	2	7
	T	42	41	8	20
Nag					
	S&T	3	0		

Table IV: 2.11 (Contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with literature	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	1	14
	T	15	8	1	13
Raj	N	4	4	3	75
	S	18	17	1	6
	T	22	21	4	19
Sik	N	1	1	1	100
	S	3	1	0	0
	T	4	2	1	50
TN	N	1	1	0	0
	S	10	8	5	63
	T	11	9	5	56
UP	N	4	4	3	75
	S	13	10	1	10
	T	17	14	4	29
WB	N	1	1	1	100
	S	13	8	5	63
	T	14	9	6	67
All India	N	51	46	26	57
	S	242	196	41	21
	T	293	242	67	28

Table IV: 2.12 Availability of Maps

1		2	3	4	5
State/ U.T.		Total N/S	Availability of Maps		
			N/S Res- ponding	N/S with Maps	4 as % of 3
A&N	N	6	2	1	50
	S	5	3	2	67
	T	11	5	3	60
AP		S&T	15	14	93
Aru	N	1	1	1	100
	S	4	4	4	100
	T	5	5	5	100
Bih		S&T	13	9	89
Goa	N	1	1	1	100
	S	3	3	3	100
	T	4	4	4	100
Guj	N	4	4	4	100
	S	12	11	10	91
	T	16	15	14	93
Har		S&T	1	1	100
HP	N	1	1	1	100
	S	29	28	23	82
	T	30	29	24	83
J&K	N	3	2	2	100
	S	6	4	1	25
	T	9	6	3	50
Kar	N	3	2	1	50
	S	14	14	11	79
	T	17	16	12	75
Ker	N	3	3	2	67
	S	11	11	6	55
	T	14	14	8	57
Mah	N	4	4	3	75
	S	22	10	10	100
	T	26	14	13	93
Man		N&T	2	1	100
Meg		S&T	2	2	100
MP	N	11	10	9	90
	S	31	27	20	74
	T	42	37	29	78
Nag		S&T	3	0	

Table IV: 2.12 (contd)

1	2	3	4	5
State/ U.T.	Total N/S	Availability of Maps		
		N/S Res- ponding	N/S with Maps	4 as % of 3
Ori	N	1	1	100
	S	14	6	83
	T	15	7	86
Raj	N	4	4	100
	S	18	15	53
	T	22	19	63
Sik	N	1	1	100
	S	3	1	100
	T	4	2	100
TN	N	1	1	100
	S	10	8	38
	T	11	9	44
UP	N	4	4	100
	S	13	11	64
	T	17	15	73
WB	N	1	1	100
	S	13	9	89
	T	14	10	90
All India	N	51	43	88
	S	242	191	76
	T	293	234	79

Table IV: 2.13 Film/slide Shows for Tourists

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with shows	4 as % of 3
A&N	N	6	4	0	0
	S	5	6	2	33
	T	11	10	2	20
AP					
	S&T	15	13	1	8
Aru	N	1	1	1	100
	S	4	4	1	25
	T	5	5	2	40
Bih					
	S&T	13	9	1	11
Goa	N	1	1	0	0
	S	3	3	1	33
	T	4	4	1	25
Guj	N	4	4	2	50
	S	12	11	4	36
	T	16	15	6	40
Har					
	S&T	1	1	0	0
HP	N	1	1	0	0
	S	29	27	0	0
	T	30	28	0	0
J&K	N	3	2	0	0
	S	6	4	0	0
	T	9	6	0	0
Kar	N	3	2	2	100
	S	14	14	4	29
	T	17	16	6	38
Ker	N	3	3	1	33
	S	11	11	0	0
	T	14	14	1	7
Mah	N	4	4	3	75
	S	22	10	1	10
	T	26	14	4	29
Man					
	N&T	2	1	0	0
Meg					
	S&T	2	2	0	0
MP	N	11	11	3	27
	S	31	31	1	3
	T	42	42	4	10
Nag					
	S&T	3	0		

Table IV: 2.13 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with shows	4 as % of 3
Ori	N	1	1	1	100
	S	14	7	2	29
	T	15	8	3	38
Raj	N	4	4	2	50
	S	18	17	1	6
	T	22	21	3	14
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	1	100
	S	10	8	1	13
	T	11	9	2	22
UP	N	4	4	2	50
	S	13	11	0	0
	T	17	15	2	13
WB	N	1	1	0	0
	S	13	9	0	0
	T	14	10	0	0
All India	N	51	46	18	39
	S	242	199	20	10
	T	293	245	38	16

Table IV: 2.14 &amp; Table IV: 2.15 Trained Guides and Extension Officers

1	2	3	4	5	6	7	8
State/ U.T.	Total N/S	Trained guides			Extension officers		
		N/S res- ponding	N/S having guides	4 as % of 3	N/S res- ponding	N/S having EO*	7 as % of 6
A & N	N	6	5	0	5	0	0
	S	5	3	0	3	0	0
	T	11	8	0	8	0	0
AP							
	S & T	15	11	0	11	0	0
Aru	N	1	1	0	1	0	0
	S	4	2	0	2	1	50
	T	5	3	0	3	1	33
Bih							
	S & T	13	8	1	9	1	11
Goa	N	1	1	0	1	0	0
	S	3	3	0	3	0	0
	T	4	4	0	4	0	0
Guj	N	4	4	1	4	0	0
	S	12	11	3	11	1	9
	T	16	15	4	15	1	7
Har							
	S & T	1	1	0	1	0	0
HP	N	1	0		0		
	S	29	24	0	24	0	0
	T	30	24	0	24	0	0
J & K	N	3	2	2	2	0	0
	S	6	3	1	3	0	0
	T	9	5	3	5	0	0
Kar	N	3	2	0	2	0	0
	S	14	12	0	12	0	0
	T	17	14	0	14	0	0
Ker	N	3	3	1	3	0	0
	S	11	10	2	10	0	0
	T	14	13	3	11	0	0
Mah	N	4	4	0	4	0	0
	S	22	8	0	8	0	0
	T	26	12	0	12	0	0
Man							
	N & T	2	1	0	1	0	0
Meg							
	S & T	2	2	0	2	0	0
MP	N	11	10	1	10	0	0
	S	31	23	2	22	0	0
	T	42	33	3	32	0	0

\* EO = Extension officers

Table IV: 2.14 &amp; Table IV: 2.15 (contd)

1	2	3	4	5	6	7	8
State/ U.T.	Total N/S	Trained guides			Extension officers		
		N/S res- ponding	N/S having guides	4 as % of 3	N/S res- ponding	N/S having EO*	7 as % of 6
Nag							
S & T	3	0			0		
Ori	N 1	1	1	100	1	0	0
	S 14	5	1	20	5	0	0
	T 15	6	2	33	6	0	0
Raj	N 4	4	2	50	4	0	0
	S 18	15	1	7	16	0	0
	T 22	19	3	16	20	0	0
Sik	N 1	1	0	0	1	0	0
	S 3	1	0	0	1	0	0
	T 4	2	0	0	2	0	0
TN	N 1	1	0	0	1	0	0
	S 10	7	3	43	7	3	43
	T 11	8	3	38	8	3	38
UP	N 4	4	2	50	4	0	0
	S 13	12	0	0	12	0	0
	T 17	16	2	13	16	0	0
WB	N 1	1	1	100	1	0	0
	S 13	6	1	17	8	0	0
	T 14	7	2	29	9	0	0
All India	N 51	45	11	24	43	0	0
	S 242	167	15	9	170	6	4
	T 293	212	26	12	213	6	3

Table IV: 2.16 Educational Programmes for Villagers

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with programmes	4 as % of 3
A&N	N	6	4	1	25
	S	5	6	0	0
	T	11	10	1	10
AP					
	S&T	15	14	0	0
Aru	N	1	1	1	100
	S	4	4	1	25
	T	5	5	2	40
Bih					
	S&T	13	9	1	11
Goa	N	1	1	0	0
	S	3	3	2	67
	T	4	4	2	50
Guj	N	4	4	0	0
	S	12	11	2	18
	T	16	15	2	13
Har					
	S&T	1	1	0	0
HP	N	1	1	1	100
	S	29	27	0	0
	T	30	28	1	4
J&K	N	3	2	1	50
	S	6	4	4	100
	T	9	6	5	83
Kar	N	3	2	1	50
	S	14	14	4	29
	T	17	16	5	31
Ker	N	3	3	0	0
	S	11	10	1	10
	T	14	13	1	8
Mah	N	4	3	0	0
	S	22	10	1	10
	T	26	13	1	8
Man					
	N&T	2	1	0	0
Meg					
	S&T	2	2	0	0
MP	N	11	10	0	0
	S	31	31	1	3
	T	42	41	1	2
Nag					
	S&T	3	0		

Table IV: 2.16 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with programmes	4 as % of 3
Ori	N	1	1	1	100
	S	14	7	2	29
	T	15	8	3	38
Raj	N	4	4	0	0
	S	18	16	1	6
	T	22	20	1	5
Sik	N	1	1	1	100
	S	3	1	0	0
	T	4	2	1	50
TN	N	1	1	0	0
	S	10	8	1	13
	T	11	9	1	11
UP	N	4	4	2	50
	S	13	11	0	0
	T	17	15	2	13
WB	N	1	1	0	0
	S	13	8	2	25
	T	14	9	2	22
All India	N	51	44	9	20
	S	242	197	23	12
	T	293	241	32	13

Table IV: 2.17 Introduction of Flora

1		2	3	4	5
State/ U.T.		Total N/S	N/S res- ponding	N/S in- troducing	4 as % of 3
A&N	N	6	5	0	0
	S	5	4	0	0
	T	11	9	0	0
AP					
	S&T	15	9	1	11
Aru	N	1	1	0	0
	S	4	4	2	50
	T	5	5	2	40
Bih					
	S&T	13	9	3	33
Goa	N	1	1	0	0
	S	3	3	1	33
	T	4	4	1	25
Guj	N	4	3	0	0
	S	12	6	2	33
	T	16	9	2	22
Har					
	S&T	1	1	1	100
HP	N	1	1	0	0
	S	29	25	5	20
	T	30	26	5	19
J&K	N	3	2	1	50
	S	6	4	0	0
	T	9	6	1	17
Kar	N	3	1	1	100
	S	14	13	3	23
	T	17	14	4	29
Ker	N	3	3	1	33
	S	11	11	4	36
	T	14	14	5	36
Mah	N	4	4	1	25
	S	22	10	3	30
	T	26	14	4	29
Man					
	N&T	2	1	0	0
Meg					
	S&T	2	2	0	0
MP	N	11	11	0	0
	S	31	29	1	3
	T	42	40	1	3
Nag					
	S&T	3	1	0	0

Table IV: 2.17 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S res- ponding	N/S in- troducing	4 as % of 3
Ori	N	1	0		
	S	14	6	3	50
	T	15	6	3	50
Raj	N	4	4	1	25
	S	18	19	4	21
	T	22	23	5	22
Sik	N	1	0		
	S	3	1	0	0
	T	4	1	0	0
TN	N	1	1	0	0
	S	10	7	1	14
	T	11	8	1	13
UP	N	4	4	1	25
	S	13	12	1	8
	T	17	16	2	13
WB	N	1	1	1	100
	S	13	6	2	33
	T	14	7	3	43
All India	N	51	43	7	16
	S	242	192	37	19
	T	293	235	44	19

Table IV: 2.18 Breeding Programmes for Fauna

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	4 as % of 3	Name of species	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
A & N S	6 5	5 5	0 1	0 20	Saltwater crocodile	1979	Captive breeding, arti- ficial incubation of eggs, rearing and hatching at the crocodile complex, Haddo Zoo. Introduction of the crocodiles in the sanctuary as well as shifting the complex to the sanctuary.		
T	11	10	1	10					
AP									
S & T	15	13	3	23	Sambar Spotted deer 4-horned antelope Nilgai	1974 1974 1974 1974	Breeding stock Breeding stock Breeding stock Breeding stock	3 5 # #	3 47 1 2
					Spotted deer Sambar Nilgai Spotted deer Sambar	1972 1972 1972 1984-85	Breeding release Breeding release Breeding release Breeding and releasing in fenced enclosures	2 2 2 2	60 40 21 Nil
Aru	N S T	1 4 5	1 4 5	0 0 0					
Bih	S & T	13	9	1	11	Spotted deer	Breeding		Fence still under con- struction

# Number not known by wildlife authorities

Table IV: 2.18 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	% of 3	Name of species	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
Goa	N	1	0	0					
S	3	3	1	33	African lion	1979	Zoo keeping	2	2
					Spotted deer	1979	Zoo keeping	4	34
					Wild boar	1979	Zoo keeping	4	21
					Freshwater crocodile	1979	Zoo keeping	2	19
					Porcupine	1979	Zoo keeping	4	9
					Sambar	1979	Zoo keeping	6	17
T	4	4	1	25					
Gj	N	4	4	50	Freshwater crocodile	1976-77	Artificial breeding for restocking	200	1000
					Green Sea and Olive	1982-83	Egg collection and hatching for release	#	#
					Ridley turtle		Artificial breeding, Restocking	#	
S	12	10	2	20	Freshwater crocodile	1976-77			
					Ducks, Blackwinged stilt, Jacana, Moorhen, Coot, Heron, Pelican, Storks, Spoonbill, Waders	from 1985			
T	16	14	4	29					
Har									
S & T	1	1	0	0					

Table IV: 2.18 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	4 as % of 3	Name of species	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
HP	N 1 S 29	1 28	0 4	0 14	Gharial Sambar Asiatic lion Spotted deer Hog deer Barking deer	1958  1978 1978 1978	Breeding is proposed Breeding for rehabilitation Breeding for rehabilitation Breeding for rehabilitation Breeding for rehabilitation	 3 3 2	22 8 37 12 12
	T 30	29	4	14					
J&K	N 3 S 6 T 9	1 1 2	0 0 0	0 0 0					
Kar	N 3	3	1	33	Crocodile Leopard Lion Bison Spotted deer Sambar Birds Silky fowl Blue rock pigeon	1974 1979 1975 1978 1978 1978 1978 1978	Breeding Breeding Breeding Breeding Breeding Breeding Breeding	10 2 6 2 20 6 6 30	16 7 30 12 80 12 10 50
Ker	N 3 S 11	3 11	0 1	0 9	Freshwater crocodile Spotted deer	1978 1984	Farming Breeding	76 11	Not multi- plying Being watched
	T 14	14	1	7					

Table IV: 2.18 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	4 as % of 3	Name of species	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
Mah	N	4	4	1	25	Freshwater crocodile	1977	Breeding in captivity	Population estimate not made
	S	22	10	1	10	Black buck	1974		9
	T	26	14	2	14	Spotted deer	1974		3
Man	N & T	2	1	0	0				
Meg	S & T	2	2	0	0				
MP	N	11	10	0	0				
	S	31	29	1	3	Gharial	1979	Rearing for release	17
	T	42	39	1	3				1000
Nag	S & T	3	2	0	0				

Table IV: 2.18 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	4 as % of 3	Name of species	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
Or	N	1							
	S	14	3	38	Tiger	1967	Captive breeding	3	28
					Lion	1979	Captive breeding	4	16
					Leopard	1976	Captive breeding	4	18
					Himalayan black bear	1983	Captive breeding	2	4
					Hyena	1982		7	7
					Indian Chevrotain	1983		2	4
					Sambar	1965		4	48
					Antelopes	1965		5	52
					Mithun	1983		2	4
					Lion-tailed monkey	1983		3	3
					Spotted deer	1965		6	72
					Saltwater crocodile	1975	Collection of nests from the wild kept for about 4 years and released to nature (cap- tive breeding has not yet been resumed).	30	400
					Freshwater crocodile	1982	Captive breeding	4	105
					Olive Ridley turtle	1976	Protection of nesting beach and nests from human and non-human predators. Hatching programme and the consequent return to nature.	1.5 lakl	3.5 lakh (Nesting females only)
T					Gharial	1975	Rearing of eggs collected from outside the state	5	215 in captive, 183 released
						1979	Captive breeding		
						1984	Captive breeding; 2 female <sup>c</sup> released	5	132
		15	8	3					38

Table IV: 2.18 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	4 as % of 3	Name of species in Trevor tank	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
Raj	N 4 S 18 T 22	4 13 17	0 1 1	0 8 6	If introduction of crocodiles is successful there is a proposal to start crocodile breeding in Trevor tank				
Sik	N 1 S 3 T 4	1 1 2	1 0 1	100 0 50	Musk deer	1984	Captive breeding	1M, 1F*	1M, 1F
TN	N 1 S 10 T 11	1 7 8	0 1 1	0 14 13	Freshwater crocodile	1976	Species extinct because of poaching and hunting. Eggs have been collected from the reservoir and breeding programme was initiated. Young ones to be released in the reservoir which is located on the boundary of sanctuary	12	823
UP	N 4 S 13 T 11	3 12 8	1 3 1	33 25 13	Great Indian rhino- ceros Gharial Gharial	1984 1976 1979	Reintroduction Breeding Releasing young ones in the river Breeding Releasing young ones in the river Breeding and scientific extraction of musk from the male	3 500 83 6 3	
					Freshwater crocodile	1976 1979			
					Musk deer	1980-81			6 (3 adults and 3 young ones)
T	17	15	4	27					

\* M-Male, F-Female

Table IV: 2.18 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S arti- ficially breeding fauna	4 as % of 3	Name of species	Year of initia-	Type of programme	Population of species when programme initiated	Current population of species
WB	N	1	1	100	Olive Ridley turtle	1983	Aided hatching and releas- ing the young ones		
	S	13	6	67	Black buck	1967 1979 1968 1978-79	Captive breeding Rearing for multiplication Captive breeding Captive rearing	4M, 7F 2 4M, 4F In exis- tence in natural habitation	42 53 No census has been done
					Barking deer	1978	Rearing for multiplication	2	10
					Spotted deer	1978	Rearing for multiplication	2	15
					Monal pheasant	1936	Introduced in the Sanctuary	Not known	Does not exist
					Olive Ridley turtle	1983	Aided in hatching and then releasing the young ones		
T	14	10	7	70					
All									
India	N	51	44	7	16				
	S	242	192	29	15				
	T	293	236	36	15				

Table IV: 2.19 Introduction of Fauna +

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- ponding	N/S with intro- duction	4 as % of 3	Year of introduc- tion	Species intro- duced & mode of introduction *	Reason for intro- duction	Current status of species
A & N	N 6	5	0	0				
	S 5	5	0	0				
	T 11	10	0	0				
AP								
	S & T 15	14	0	0				
Aru	N 1	1	0	0				
	S 4	4	0	0				
	T 5	5	0	0				
Bih								
	S & T 13	9	0	0				
Goa	N 1	1	0	0				
	S 3	3	0	0				
	T 4	4	0	0				
Guj	N 4	4	0	0				
	S 12	11	0	0				
	T 16	15	0	0				
Har								
	S & T 1	1	0	0				
HP	N 1	1	0	0				
	S 29	28	2	7	About 100 years ago 1983 1983	Red Deer-few pairs released Spotted deer Hog deer- released in deer safari park enclosure	For pleasure For display For display	24 16 6
	T 30	29	2	7				
J & K	N 3	2	0	0				
	S 6	3	1	33	1982 1982	Black buck Sambar	To increase numbers To increase numbers	\$ \$
	T 9	5	1	20				
Kar	N 3	2	1	50	1981	Crocodile #- reared in cap- tivity for 7 years, to be released in tanks (5 cro- codiles)	\$	10-12
	S 14	14	0	0				
	T 17	16	1	6				

+ Please see text in Section IV: 2.19 for some qualifications regarding the term 'Introduction' and the data in this table.

\* Mode of introduction not reported for all cases of introduction

# All crocodiles referred to in this table are the Freshwater crocodile *Crocodylus palustris*

Table IV: 2.19 (contd)

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- ponding	N/S with intro- duction	4 as % of 3	Year of introduc- tion	Species intro- duced & mode of introduction *	Reason for intro- duction	Current status of species
Ker	N	3	3	1	33	1936	Spotted deer captured and released	\$ Disapp- eared
	S	11	11	1	9	1965-67	Nilgai captured and directly rele- ased into forest	\$ Disapp- eared
	T	14	14	2	14			
Mah	N	4	4	1	25	1971-72	Sambar, Spot- ted deer, Nilgai, 4- horned ante- lope, Porcu- pine, Giant squ- irrel released from captivity	To in- crease wildlife popula- tion
						1982-83	Tortoise, Indian fox, Barking deer, Monitor lizard released from captivity	To in- crease wildlife popula- tion
	S	22	10	0	0			
	T	26	14	1	7			
Man	N & T	2	1	0	0			
Meg	S & T	2	2	0	0			
MP	N	11	11	1	9	1980	Swamp deer tranquillised and trans- ported	To as- ess suit- ability of habi- tat as a new home for the th- reatened species
	S	31	31	2	6	1982	Great Indian bustard- breeding for release	\$ 15 birds
						1982	Crocodiles brought from Kukrail and released in river	Near- ing ex- tinction; restock- ing needed
	T	42	42	3	7			
Nag	S & T	3	1	0	0			

Table IV: 2.19 (contd)

1	2	3	4	5	6	7	8	9
State/ U.T.	Total N/S	N/S res- ponding	N/S with intro- duction	4 as % of 3	Year of introduc- tion	Species intro- duced & mode of introduction *	Reason for intro- duction	Current status of species
Ori	N	1	0					
	S	14	5	1	20	1979	Hoolock gibbon	Display 1M **
						1980	Mithun	Captive 2F & 2M
						1980	Ladakhi goat @	Display 1F
						1983	Brow-antlered deer	Captive breeding 1F & 1M
						1984	Wild ass	Captive breeding 1F & 1M
	T	15	5	1	20			
Raj	N	4	4	0	0			
	S	18	18	2	11	1979	Crocodiles transported from Jaipur zoo; released in water tank	To increase fauna in tank
						1985	Crocodiles introduced into Trevor tank	As a tourist attraction
	T	22	22	2	9			
Sik	N	1	1	0	0			
	S	3	1	0	0			
	T	4	2	0	0			
TN	N	1	1	0	0			
	S	10	7	0	0			
	T	11	8	0	0			
UP	N	4	4	0	0			
	S	13	12	1	8	1957	Lion	For finding an alternate home for the lion
	T	17	16	1	6			
WB	N	1	1	0	0			
	S	13	7	2	29	\$	Spotted deer	\$
						1936	Monal pheasant	\$ Does not exist now
	T	14	8	2	25			
All India	N	51	46	4	9			
	S	242	197	12	6			
	T	293	243	16	7			

\*\* M = Male F = Female

@ The exact species being referred to is unclear

\*\* M = Male F = Female

@ The exact species being referred to is unclear

Number of N/S in which various species introduced:

Species	No of N/S	Species	No. of N/S
Red deer <i>Cervus elaphus</i>	-1	Common fox <i>Vulpes bengalensis</i>	-1
Spotted deer <i>Axis axis</i>	-4	Monitor lizard <i>Varanus sp.</i> @	-1
Hog deer <i>Axis porcinus</i>	-1	Swamp deer <i>Cervus duvauceli</i>	-1
Black buck <i>Antelope cervicapra</i>	-1	Great Indian bustard <i>Choriotis nigriceps</i>	-1
Sambar <i>Cervus unicolor</i>	-2	Ladakhi goat @	-1
Crocodile <i>Crocodylus palustris</i>	-3	Mithun	-1
Nilgai <i>Boselaphus tragocamelus</i>	-2	Hoolock gibbon <i>Hylobates hoolock</i>	-1
Four-horned antelope <i>Tetracerus quadricornis</i>	-1	Brow-antlered deer <i>Cervus eldi eldi</i>	-1
Indian porcupine <i>Hystrix indica</i>	-1	Wild ass <i>Asinus (Equus) hemionus khur</i>	-1
Giant squirrel @	-1	Lion <i>Panthera leo persica</i>	-1
Tortoise @	-1	Monal pheasant <i>Leophophorus impejanus</i>	-1
Barking deer <i>Muntiacus muntjac</i>	-1		

@ The exact species being referred to is unclear

Table IV: 2.20 Re-introduction<sup>+</sup> of Fauna

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S re- intro- ducting	4 as % of 3	Name of species	Year and cause of disappearance	Year of re- introduction	Mode of re- introduction	Current status
A & N	N 6 S 5 T 11	2 4 6	0 1 1	0 25 17	Saltwater crocodile	Human disturbances	Yet to be introduced		
AP	S & T 15	14	1	7	Saltwater crocodile	Human distur- bances and hunt- ing for skin	1978, 3 were released	Artificially bred & released when 12 m long	Exact numbers not known
And	N 1 S 4 T 5	1 4 5	0 0 0	0 0 0					
Bih	S & T 13	9	1	11	Spotted deer	Hunting		To be kept under fence area which is still under construction	
Goa	N 1 S 3 T 4	1 3 4	0 0 0	0 0 0					
Gj	N 4 S 12 T 16	4 11 15	1 1 2	25 9 13	Black buck  Grey hornbill		1978  1979-80	Captured from Velavadar National Park Brought from outside	Not present  Not present
Har	S & T 1	0							
HP	N 1 S 29 T 30	1 28 29	0 2 2	0 7 7	Cheer pheasant Spotted deer	Poaching	1968 1983	Still kept in a big enclosure	All died

<sup>+</sup> Please see text in Section IV: 2.20 for some qualifications regarding the term 're-introduction.'

Table IV: 2.20 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S re- intro- ducing	4 as % of 3	Name of species	Year and cause of disappearance	Year of re- introduction	Mode of re- introduction	Current status
J & K	N 3 S 6 T 9	2 4 6	0 0 0	0 0 0					
Kar	N 3 S 14 T 17	2 14 16	0 0 0	0 0 0					
Ker	N 3 S 11	3 11	0 1	0 9	Spotted deer	1965		Captured and directly released into forest	Disappea- red
					Sambar Hog deer	1967-75 1979		Enclosure	Surviving Not surviv- ing
	T 14	14	1	7					
Mah	N 4	4	1	25	Sambar	Between 1950-60	1971-72	Through trans- porting in cages from captivity (As above)	Satis- factory
					Spotted deer	Between 1950-60; due to industrial growth	1971-72	(As above)	-do-
					Barking deer	Between 1930-40	1971-72	(As above)	-do-
					Fourhorned antelope	Between 1950-60	1971-72	(As above)	-do-
					Nilgai	Between 1930-40	1971-72	(As above)	-do-
	S 22 T 26	10 14	0 1	0 7					
Man	N & T 2	1	0	0					
Meg	S & T 2	0							

Table IV: 2.20 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S re- intro- ducing	4 as % of 3	Name of species	Year and cause of disappearance	Year of re- introduction	Mode of re- introduction	Current status
MP	N 11 S 31	11 31	1 2	9 6	* Great Indian bustard Gharial	1972, because of un- authorised shooting 1982	1978 1982	Eight Gharials were released on the river banks	15 birds at 3 centres
	T 42	42	3	7					
Nag	S & T 3	1	0	0					
Orh	N 1 S 14	0 9	0 3	0 33	Proposal to introduce Black bucks under con- sideration Four horned antelope Indian wolf Jackal Gharial	1982, due to natural causes 1983 1979 1975, due to floods & fishing nets	1984  1984 1984 1978 onwards	Scientific care and management  Scientific care & management (As above) (As above) Release of 182 captive-reared animals, 1 mtr long	1 Female and 2 Males  1 Female 2 Males 1 Male 1 Male Rare
	T 15	9	3	33					
Raj	N 4 S 18	4 12	0 1	0 8	Gharial		1983	Release of young Ch- arials reared at Ko- factory ta after hatching	Satis- factory
	T 22	16	1	6					
Sik	N 1 S 3	1 1	0 0	0 0					
	T 4	2	0	0					

\* Monitor lizard, Python, Black buck, Indian gazelle, Four-horned antelope, Leopard, Tiger, Langur, Sloth bear, Spotted deer, Nilgai, Sambar, Wild boar, Peafowl

Table IV: 2.20 (contd)

1	2	3	4	5	6	7	8	9	10
State/ U.T.	Total N/S	N/S res- ponding	N/S re- intro- ducing	4 as % of 3	Name of species	Year and cause of disappearance	Year of re- introduction	Mode of re- introduction	Current status
TN	N 1 S 10 T 11	1 7 8	0 0 0	0 0 0					
UP	N 4 S 13 T 17	4 12 16	1 0 1	25 0 6	Great Indian rhinoceros	1870, because of hunting	1984	Translocation	3 in number
WB	N 1 S 13 T 14	1 9 10	0 2 2	0 22 20	Spotted deer Black buck	1956, due to poaching 1984, due to disease	1983 Not yet reintroduced	31 released from captive stock To be procured from Park/Sanctuary	36 in number None
All India	N 51 S 242 T 293	43 194 237	4 15 19	9 8 8					

Table IV:3.1 Number\* and Wildlife Training of Personnel in Parks/Sanctuaries (1983-84) (Extended Database)

<i>N/S</i>	<i>Total staff</i>	<i>Training in wildlife</i>
A&N/N/MAR	10	Y
A&N/N/MOU	3	Y
A&N/S/CRO	9	Y
AP/S/COR	11	Y
AP/S/ETU	70	Y
AP/S/KAW	8	N
AP/S/KIN	16	Y
AP/S/KOL	3	Y
AP/S/MAN	4	N
AP/S/NAG	123	Y
AP/S/NEL	2	Y
AP/S/PAK	88	Y
AP/S/PAP	20	Y
AP/S/POC	11	N
AP/S/PRA	1	N
AP/S/PUL	1	N
AP/S/SIW	2	N
ARU/N/NAM	29	Y
ARU/S/ITA	53	N
ARU/S/LAL	21	Y
ARU/S/LAL	11	Y
ARU/S/MEH	13	N
BIH/S/BHI	18	Y
BIH/S/DAL	21	Y
BIH/S/GAU	7	Y
BIH/S/HAZ	32	Y
BIH/S/LAW	17	Y
BIH/S/PAL	92	Y
BIH/S/TOP	3	N
BIH/S/VAL	81	Y
CHA/S/SUK	48	N
GOA/N/BHA	9	Y
GOA/S/BHA	9	Y
GOA/S/BON	33	Y
GOA/S/COT	20	N
GUJ/N/BAN	7	Y
GUJ/N/GIR	302	Y
GUJ/N/MAR	48	N
GUJ/N/VEL	14	Y
GUJ/S/BAR	6	N
GUJ/S/DHR	34	N
GUJ/S/DUM	8	N
GUJ/S/HIN	5	N
GUJ/S/JES	11	N

\* For details on density of staff, i.e. staff members per ha. in various national parks and sanctuaries, see Section IV:3.1 of the report.

Table IV: 3.1 (contd)

Name of N/S	Total staff	Training in wildlife
GUJ/S/KHI	5	N
GUJ/S/NAL	38	N
GUJ/S/NAR	5	Y
GUJ/S/RAT	11	N
HAR/S/SUL	5	N
HP/N/PIN	2	Y
HP/S/CHA	24	N
HP/S/DARA	4	N
HP/S/GAM	6	N
HP/S/KAL	11	N
HP/S/KAN	3	N
HP/S/KUG	6	N
HP/S/MAN	4	Y
HP/S/NAI	4	N
HP/S/NAR	4	Y
HP/S/PON	6	N
HP/S/REN	8	N
HP/S/RUP	4	N
HP/S/SEC	1	N
HP/S/SHIK	3	N
HP/S/SHIM	5	
HP/S/SIM	6	N
HP/S/TIR	4	N
HP/S/TUN	4	N
J&K/N/DAC	24	Y
J&K/N/HEM	13	
J&K/N/KIS	14	N
J&K/S/JAS	8	N
J&K/S/NAN	2	N
J&K/S/OVE	7	
J&K/S/RAM	14	N
J&K/S/SUR	10	N
KAR/N/BAND	126	N
KAR/N/BANN	55	N
KAR/N/NAG	217	Y
KAR/S/ADI	1	N
KAR/S/BHA	15	N
KAR/S/BIL	14	N
KAR/S/BLA	43	Y
KAR/S/BRA	2	N
KAR/S/DAN	10	Y
KAR/S/MEL	3	N
KAR/S/NUG	1	N
KAR/S/RAN	2	N
KAR/S/SHA	6	N
KAR/S/SHE	7	N
KAR/S/SOM	2	N

Table IV: 3.1 (contd)

N/S	Total staff	Training in wildlife
KER/N/ERA	15	Y
KER/N/PER	99	Y
KER/S/CHIN	4	
KER/S/IDU	6	N
KER/S/NEY	17	Y
KER/S/PEP	4	N
KER/S/PAR	99	Y
KER/S/SHE	3	
KER/S/WYN	19	N
MAH/N/NAW	32	N
MAH/N/PEN	3	N
MAH/N/SAN	33	Y
MAH/N/TAD	43	Y
MAH/S/BOR	23	N
MAH/S/DEU	7	N
MAH/S/DHA	113	Y
MAH/S/GRE	22	Y
MAH/S/KAR	13	Y
MAH/S/KIN	32	N
MAH/S/MEL	144	Y
MAH/S/NAG	104	N
MAH/S/RAD	10	N
MAH/S/TAN	117	
MAH/S/YAW	23	N
MAN/N/KEI	24	N
MAN/N/SIR	6	N
MEC/S/NON	19	N
MEG/S/SIJ	12	Y
MIZ/S/DAM	14	Y
MP/N/BAN	52	Y
MP/N/IND	58	Y
MP/N/KANH	233	Y
MP/N/KANG	15	N
MP/N/MAD	37	Y
MP/N/PAN	81	Y
MP/N/PEN	26	N
MP/N/SAN	130	Y
MP/N/SAT	49	Y
MP/N/VAN	10	Y
MP/S/ACH	56	Y
MP/S/BAD	11	Y
MP/S/BAG	24	N
MP/S/BAR	43	N
MP/S/BOR	51	Y
MP/S/GAN	15	Y
MP/S/GHA	21	Y
MP/S/GOM	30	N

Table IV: 3.1 (contd)

N/S	Total staff	Training in wildlife
MP/S/KAR	25	N
MP/S/KEN	21	N
MP/S/KHE	21	Y
MP/S/NAR	18	Y
MP/S/NAT	23	Y
MP/S/NAU	134	N
MP/S/PAC	56	N
MP/S/PAL	42	N
MP/S/PAN	56	N
MP/S/PEN	20	Y
MP/S/PHE	15	N
MP/S/RAT	129	N
MP/S/SAI	6	N
MP/S/SAN	33	Y
MP/S/SEM	39	Y
MP/S/SIN	57	Y
MP/S/SIT	120	N
MP/S/SON	30	Y
MP/S/TAM	27	
MP/S/UDA	17	
NAG/S/INT	34	Y
ORI/N/SIM	80	Y
ORI/S/BHI	67	Y
ORI/S/CHA	23	
ORI/S/HAD	4	
ORI/S/NAN	102	Y
ORI/S/SAT	16	Y
ORI/S/SIM	80	Y
RAJ/N/DES	73	Y
RAJ/N/KEO	38	Y
RAJ/N/RAN	111	Y
RAJ/N/SAR	130	Y
RAJ/S/BHE	10	N
RAJ/S/DAR	23	N
RAJ/S/JAI	14	N
RAJ/S/JAM	22	N
RAJ/S/JAW	6	Y
RAJ/S/KUM	53	Y
RAJ/S/MOU	34	N
RAJ/S/NAH	34	
RAJ/S/PHU	12	N
RAJ/S/RAM	19	N
RAJ/S/SAR	130	Y
RAJ/S/SHE	9	N
RAJ/S/SIT	37	N
RAJ/S/TAL	2	N
RAJ/S/VAN	18	N

Table IV: 3.1 (contd)

N/S	Total staff	Training in wildlife
SIK/N/KHA	20	Y
SIK/S/FAM	10	N
TN/N/GUI	7	N
TN/S/ANA	205	Y
TN/S/KAL	35	
TN/S/MUD	73	Y
TN/S/NIL	8	Y
TN/S/POI	7	
TN/S/PUL	2	N
TN/S/VED	5	N
UP/N/COR	185	Y
UP/N/DUD	89	Y
UP/N/NAN	22	N
UP/N/VAL	5	N
UP/S/CHA	4	N
UP/S/CHI	17	N
UP/S/GOV	29	Y
UP/S/KAI	12	N
UP/S/KAT	19	N
UP/S/KED	28	N
UP/S/KIS	18	N
UP/S/MAH	2	N
UP/S/MOT	10	Y
UP/S/NAT	42	N
UP/S/NAW	3	N
UP/S/RAJ	48	Y
UP/S/RAN	24	N
WB/N/SUN	62	
WB/S/BAL	5	N
WB/S/JAL	71	Y
WB/S/SAJ	57	

**Consolidated figures**

National Parks with staff: 45

Sanctuaries with staff: 171

National Parks whose staff has at least one member trained in wildlife: 30

Sanctuaries whose staff has at least one member trained in wildlife: 61

Table IV:3.2 Honorary Wildlife Wardens (HWLW)

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having HWLW	4 as % of 3
A & N N	6	2	2	100
S	5	3	2	67
T	11	5	4	80
AP S & T	15	2	2	17
Aru N	1	1	0	0
S	4	2	1	50
T	5	3	1	33
Bih S & T	13	7	0	0
Goa N	1	1	0	0
S	3	3	0	0
T	4	4	0	0
Guj N	4	4	4	100
S	12	10	4	40
T	16	14	8	57
Har S & T	1	1	0	0
HP N	1	1	1	100
S	29	26	7	27
T	30	27	8	30
J & K N	3	2	2	100
S	6	4	4	100
T	9	6	6	100
Kar N	3	2	1	50
S	14	14	12	86
T	17	16	13	81
Ker N	3	1	0	0
S	11	7	0	0
T	14	8	0	0
Mah N	4	3	2	67
S	22	8	3	38
T	26	11	5	45
Man N & T	2	1	0	0
Meg S & T	2	2	0	0
MP N	11	10	2	20
S	31	24	5	21
T	42	34	7	21
Nag S & T	3	0		

Table IV:3.2 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having HWLW	4 as % of 3
Ori	N	1	1	1	100
	S	14	4	2	50
	T	15	5	3	60
Raj	N	4	4	2	50
	S	18	14	4	29
	T	22	18	6	33
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	7	1	14
	T	11	8	1	13
UP	N	4	4	2	50
	S	13	10	5	50
	T	17	14	7	50
WB	N	1	1	0	0
	S	13	8	1	13
	T	14	9	1	11
All India	N	51	40	19	48
	S	242	167	53	32
	T	293	207	72	35

Table IV: 3.3 Association of NGOs

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having association	4 as % of 3
A & N				
N	6	5	0	0
S	5	4	0	0
T	11	9	0	0
AP				
S & T	15	14	0	0
Aru				
N	1	1	0	0
S	4	4	0	0
T	5	5	0	0
Bih				
S & T	13	8	1	13
Goa				
N	1	1	0	0
S	3	3	0	0
T	4	4	0	0
Guj				
N	4	4	2	50
S	12	11	4	36
T	16	15	6	40
Har				
S & T	1	1	0	0
HP				
N	1	1	0	0
S	29	28	2	7
T	30	29	2	7
J & K				
N	3	2	1	50
S	6	2	0	0
T	9	4	1	25
Kar				
N	3	2	0	0
S	14	14	2	14
T	17	16	2	13
Ker				
N	3	3	2	67
S	11	11	0	0
T	14	14	2	14
Mah				
N	4	4	1	25
S	22	11	2	18
T	26	15	3	20
Man				
N & T	2	1	0	0
Meg				
S & T	2	2	0	0
MP				
N	11	11	0	0
S	31	31	1	3
T	42	42	1	2
Nag				
S & T	3	0		

Table IV: 3.3 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having association	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	3	43
	T	15	8	3	38
Raj	N	4	4	1	25
	S	18	16	2	13
	T	22	20	3	15
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	8	3	38
	T	11	9	3	33
UP	N	4	4	1	25
	S	13	13	2	15
	T	17	17	3	18
WB	N	1	1	0	0
	S	13	9	1	11
	T	14	10	1	10
All India	N	51	47	8	17
	S	242	198	23	12
	T	293	245	31	13

Table IV: 3.4 Availability of Equipment

1		2	3	4	5	6	7	8	9	10	11	12
		N/S with										
State/ U.T.		Total N/S	N/S res- pond- ing	N/S hav- ing equip- ment	4 as % of 3	Fixed wire- less sets	Port- able wire- less sets	Rifles/ guns	Bino- cul- ars	Elect- ronic track- ing equip- ment	Dart guns	Infra red view- ers
A&N	N	6	6	1	17	1						
	S	5	4	1	25				1			
	T	11	10	2	20	1			1			
AP												
	S&T	15	13	10	77	1	1		7			
Aru	N	1	0									
	S	4	4	3	75			3	2			
	T	5	4	3	75			3	2			
Bih												
	S&T	13	7	5	71		1	4	2		1	1
Goa	N	1	0									
	S	3	0									
	T	4	0									
Guj	N	4	3	3	100	1	1	2	3			
	S	12	5	2	40	1	1	1	1			
	T	16	8	5	63	2	2	3	4			
Har												
	S&T	1	1	1	100				1			
HP	N	1	1	0	0							
	S	29	21	1	5				1			
	T	30	22	1	5				1			
J&K	N	3	2	1	50			1	1			
	S	6	3	0	0							
	T	9	5	1	20			1	1			
Kar	N	3	1	1	100	1	1	1	1		1	1
	S	14	12	5	42	1		4	2			
	T	17	13	6	46	2	1	5	3		1	1
Ker	N	3	1	1	100	1	1	1	1		1	1
	S	11	8	1	13			1	1			
	T	14	9	2	22	1	1	2	2		1	1
Mah	N	4	4	4	100				4			
	S	22	9	7	78	1	1	1	7		1	1
	T	26	13	11	85	1	1	1	11		1	1
Man												
	N&T	2	1	1	100			1	1			
Meg												
	S&T	2	2	2	100			2	1			

Table IV: 3.4 (contd)

1	2	3	4	5	6	7	8	9	10	11	12
State/ U.T.	Total N/S	N/S res- pond- ing	N/S hav- ing equip- ment	4 as % of 3	N/S with						
					Fixed wire- less sets	Port- able wire- less sets	Rifles/ guns	Bino- cul- ars	Elect- ronic track- ing equip- ment	Dart guns	Infra red view- ers
MP	N	11	10	6	60	2	2	3	6		
	S	31	22	8	36	1		2	2		
	T	42	32	14	44	3	2	5	8		
Nag	S&T	3	0								
Ori	N	1	0								
	S	14	6	5	83	1	1	4	5	1	1
	T	15	6	5	83	1	1	4	5	1	1
Raj	N	4	4	4	100	4	3	4	4	1	1
	S	18	15	7	47	1	1	4	3		
	T	22	19	11	58	5	4	8	7	1	1
Sik	N	1	1	1	100				1		
	S	3	0								
	T	4	1	1	100				1		
TN	N	1	1	1	100			1	1		
	S	10	7	7	100			3	7		
	T	11	8	8	100			4	8		
UP	N	4	4	2	50	2	2	1	2	1	1
	S	13	11	8	73			7	3		
	T	17	15	10	67	2	2	8	5	1	1
WB	N	1	1	1	100	1	1	1	1	1	1
	S	13	9	6	67	2	2	3	6	1	1
	T	14	10	7	70	3	3	4	7	2	2
All India	N	51	40	27	68	13	11	16	26	1	5
	S	242	159	79	50	9	8	39	52	1	4
	T	293	199	106	53	22	19	55	78	2	9
Percentage of N/S having different types of Equipment				N	33	28	40	65	3	13	13
				S	6	5	25	33	1	3	3
				T	11	10	28	39	1	5	5

Table IV: 3.5 Facilities for Research

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with facilities	4 as % of 3
A&N	N	6	2	0	0
	S	5	4	2	50
	T	11	6	2	33
AP					
	S&T	15	12	2	17
Aru	N	1	1	1	100
	S	4	2	0	0
	T	5	3	1	33
Bih					
	S&T	13	9	1	11
Goa	N	1	1	0	0
	S	3	3	0	0
	T	4	4	0	0
Guj	N	4	4	0	0
	S	12	11	1	9
	T	16	15	1	7
Har					
	S&T	1	1	0	0
HP	N	1	1	0	0
	S	29	26	0	0
	T	30	27	0	0
J&K	N	3	2	0	0
	S	6	3	0	0
	T	9	5	0	0
Kar	N	3	2	0	0
	S	14	13	0	0
	T	17	15	0	0
Ker	N	3	3	1	33
	S	11	9	0	0
	T	14	12	1	8
Mah	N	4	3	0	0
	S	22	10	1	10
	T	26	13	1	8
Man					
	N&T	2	1	0	0
Meg					
	S&T	2	2	0	0
MP	N	11	9	3	33
	S	31	26	2	8
	T	42	35	5	14
Nag					
	S&T	3	0		

Table IV: 3.5 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S responding	N/S with facilities	4 as % of 3
Ori	N	1	1	1	100
	S	14	5	3	60
	T	15	6	4	67
Raj	N	4	4	2	50
	S	18	15	1	7
	T	22	19	3	16
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	7	1	14
	T	11	8	1	13
UP	N	4	4	1	25
	S	13	6	0	0
	T	17	10	1	10
WB	N	1	1	1	100
	S	13	9	1	11
	T	14	10	2	20
All India	N	51	41	10	24
	S	242	174	15	9
	T	293	215	25	12

Table IV: 3.6 Quarantine Facilities

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having facilities	4 as % of 3
A & N	N 6	5	0	0
	S 5	4	0	0
	T 11	9	0	0
AP				
	S & T 15	14	1	7
Aru	N 1	1	1	100
	S 4	5	0	0
	T 5	6	1	17
Bih				
	S & T 13	9	0	0
Goa	N 1	1	0	0
	S 3	3	0	0
	T 4	4	0	0
Guj	N 4	4	0	0
	S 12	10	0	0
	T 16	14	0	0
Har				
	S & T 1	1	0	0
HP	N 1	1	0	0
	S 29	28	0	0
	T 30	29	0	0
J & K	N 3	2	0	0
	S 6	4	0	0
	T 9	6	0	0
Kar	N 3	2	1	50
	S 14	14	3	21
	T 17	16	4	25
Ker	N 3	3	0	0
	S 11	10	0	0
	T 14	13	0	0
Mah	N 4	4	0	0
	S 22	11	1	9
	T 26	15	1	7
Man				
	N & T 2	1	0	0
Meg				
	S & T 2	2	0	0
MP	N 11	10	0	0
	S 31	27	0	0
	T 42	37	0	0
Nag				
	S & T 3	0		

Table IV: 3.6 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having facilities	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	0	0
	T	15	8	0	0
Raj	N	4	4	0	0
	S	18	16	0	0
	T	22	20	0	0
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	8	0	0
	T	11	9	0	0
UP	N	4	4	1	25
	S	13	12	1	8
	T	17	16	2	13
WB	N	1	1	0	0
	S	13	8	4	50
	T	14	9	4	44
All India	N	51	46	3	7
	S	242	194	10	5
	T	293	240	13	5

Table IV: 3.7 Veterinarian in N/S

1	2	3	4	5
State/ U.T.	Total N/S	N/S respond- ing	N/S having vet	4 as % of 3
A & N	6	5	0	0
N	5	5	0	0
S				
T	11	10	0	0
AP				
S & T	15	13	0	0
Aru	1	1	1	100
N	4	4	1	25
S	5	5	2	40
T				
Bih				
S & T	13	9	0	0
Goa	1	1	0	0
N	3	3	0	0
S	4	4	0	0
T				
Guj	4	3	1	33
N	12	10	1	10
S	16	13	2	15
T				
Har				
S & T	1	1	0	0
HP	1	1	0	0
N	29	28	3	11
S	30	29	3	10
T				
J & K	3	2	0	0
N	6	3	1	33
S	9	5	1	20
T				
Kar	3	2	2	100
N	14	14	0	0
S	17	16	2	13
T				
Ker	3	3	1	33
N	11	11	0	0
S	14	14	1	7
T				
Mah	4	4	1	25
N	22	11	0	0
S	26	15	1	7
T				
Man				
N & T	2	1	0	0
Meg				
S & T	2	2	0	0
MP	11	10	1	10
N	31	29	1	3
S	42	39	2	5
T				
Nag				
S & T	3	0		

Table IV: 3.7 (contd)

1		2	3	4	5
State/ U.T.		Total N/S	N/S respond- ing	N/S having vet	4 as % of 3
Ori	N	1	1	0	0
	S	14	7	3	43
	T	15	8	3	38
Raj	N	4	4	0	0
	S	18	18	0	0
	T	22	22	0	0
Sik	N	1	1	0	0
	S	3	1	0	0
	T	4	2	0	0
TN	N	1	1	0	0
	S	10	8	2	25
	T	11	9	2	22
UP	N	4	4	0	0
	S	13	13	0	0
	T	17	17	0	0
WB	N	1	1	0	0
	S	13	9	0	0
	T	14	10	0	0
All India	N	51	45	7	16
	S	242	199	12	6
	T	293	244	19	8

